AMERICAN GAS JOURNAL

JUL 23 1939

JULY, 1939

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No smoke... and no trouble handling the heavy tar.

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The Semet-Solvay Reverse Flow principle, whether utilized in an old water gas machine converted for its use or in a new Semet-Solvay Reverse Flow Water Gas Machine, enables the operator to change generator fuel and carbureting oil at will in order to cope with changing market conditions.

In actual use in many parts of the country, Reverse Flow Water Gas Machines have proved their ability to produce a *uniform* gas of any required specification *from any fuel in common use for this purpose.* Note the wide divergence of operating methods of the two installations referred to in the illustration.

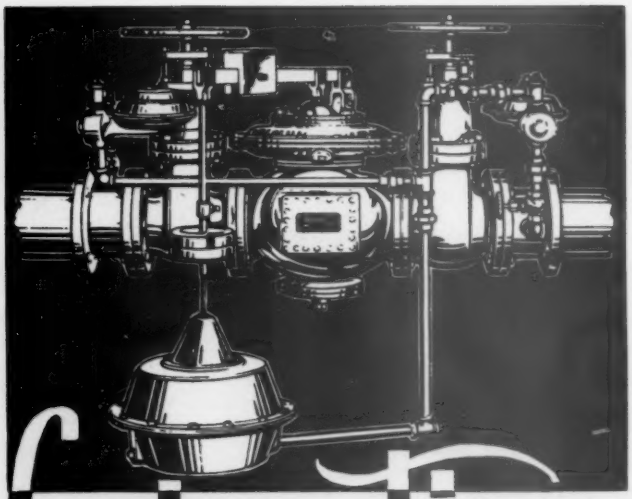
It's surprisingly simple to put your present water gas equipment on a sound, modern, more efficient, less expensive operating basis. The remarkable fuel flexibility of Reverse Flow is doing it for others. It can do it for you. Why not write for information today?

SEMET-SOLVAY

ENGINEERING *Engineers* **CORPORATION** *Contractors*

SEMET-SOLVAY ENGINEERING CORP. WE SELL SOLUTIONS TO HARD PROBLEMS NEW YORK

40 RECTOR ST. NEW YORK, N. Y.



Cooperation

REYNOLDS Regulators . . . far in the background of efficient, uninterrupted gas service . . . are doing an important job with absolute accuracy.

The modern REYNOLDS Regulator that goes into any gas control installation has been perfected through the years to a high degree of accuracy and dependability. Reynolds Regulators protect and insure efficient gas service for both company and user. Let Reynolds, with nearly a half century of successful gas control, aid by solving your gas control problems.

REYNOLDS will design and perfect a special regulator covering your specific needs if one of the present Reynolds Regulators giving perfect control from one ton to inches W. C., doesn't solve your problems. Write.

BRANCH OFFICES:

422 Dwight Building, Kansas City, Mo.

2nd Unit, Santa Fe Building, Dallas, Texas.

REPRESENTATIVES:

Eastern Appliance Company, Boston, Mass.

Wm. A. Ehlers, 49 S. Clinton Street, East Orange, N. J.

REYNOLDS GAS REGULATOR CO.

Anderson, Indiana, U. S. A.

GAS CONTROL SINCE 1892

The TRUTH about fungus mold!

● LAVINO ACTIVATED OXIDE prevents the presence of or growth of fungi or other living organisms in sponge. E. J. Lavino and Company has developed a process, for which a patent is pending, for treating LAVINO ACTIVATED OXIDE, so that sponge prepared from it cannot contain living organisms.

● This exclusive process protects you against trace trouble from fungus and is one of the recent LAVINO developments that has made possible the unprecedented LAVINO GUARANTEE PLAN whereby

"E. J. Lavino and Company guarantees a definite maximum cost per pound of sulphur removed in standard dry box purification practice using LAVINO ACTIVATED OXIDE."

● The fairness of this offer will appeal to you. To get the guarantee applied to YOUR plant, write

E. J. LAVINO AND COMPANY

1528 WALNUT ST., PHILA., PA.

CHICAGO PITTSBURGH

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YOUR INDUSTRY

1 $5,000,000,000 is the approximate total investment represented by the U.S.A. gas companies! (Note that $4,200,000,000 is the investment figure for steel production.)

To insure returns on this vast investment, chief reliance is placed on the accurate registration of some 17,000,000 gas meters in service. This means that each of the 17,000,000 meters must be relied on to protect the major part of the revenues from a $294 unit of capital investment.

2 The gas industry may point to a capital investment of $37,000 for every employee. (Compare: $25,000 for railroads; $7,000 for steel; $3,000 for the automotive industries.)

3 A total annual payroll of over $213,000,000 for the gas industry's 135,000 employees—representing an annual wage of $1,575 per employee. (Exceeding very substantially the average annual wage in the automotive and steel industries.)

4 Gas industry's 48-hour week in 1929 reduced to 40 hours by 1936—yet the 1936 average annual wage per employee was slightly higher.

5 40¢ paid to government by the gas industry in taxes, for every dollar paid in wages. Out of the 1937 national tax bill of $12,000,000,000, the public utilities paid about $900,000,000—of which the gas industry contributed a substantial part.

GENERAL OFFICES • 60 EAST 42ND STREET, NEW YORK, N. Y.

AMERICAN METER COMPANY

INCORPORATED (ESTABLISHED 1836)

1193

JULY
1939

AMERICAN
GAS JOURNAL

VOLUME 151
No. 1

Some Thoughts on Advertising

By
William H. Matlack
Champaign, Ill.

PREDICATED on the study of advertising employed by various organizations operating in both retail and wholesale fields, we believe that much of it may be improved. This is particularly true of the advertising of some public service companies.

Layout and Copy:

In reviewing thousands of advertisements used by such organizations we find many of them not designed to the mechanical requirements of readership. The layouts lack legibility, movement, simplicity, cohesion, emphasis and continuity.

The creators of such advertising seem to be afraid of humor. In a world so saturated with fear there certainly is need for a good laugh or a smile provoking picture or pun.

We need not try to be clever to the extent that we use unrelated illustrations or text that fails to tie up our sales story. We should avoid being staid, try to secure attention with a picture or pun that has a tie in, not just use "pretty girl" illustration to put in a picture. A picture may be "worth a thousand words" yet we feel that it is better omitted if it does not relate to the sales story that the advertisement is written to deliver.

Summing up these factors we believe that all advertising from inception to final production in any medium should carry a sales message. It should be a tool that will benefit the salesman in some manner. It should develop prospects for him—introduce the merchandise or service to the consumer. Provide a receptive, interested prospect for him. It should build good will for the advertiser. Its creator should give consideration to protecting the company's investment, good will, and to building up of morale of the organization.

The production of successful advertising is a difficult business, requiring both experience and skill which may amount to this, to quote from "O. K. Ahead" and reproduced in "Advertising Highlights":

"The copy a good advertising man writes may look no better than a cub's. The same facts may be there—as entertainingly presented. Analyze both ads, and the cub's may appear as good as, or even better than, the veteran's. But there's an invisible something in the seasoned man's work that cannot be easily detected. Nor can its absence be readily seen in the other copy. What it is the seasoned writer does we do not know unless he puts added sincerity into his copy which is the vital attribute to sales success."

CONVENIENT
GAS gives the only fully automatic heating service
Gas is the only fuel that gives you 100% automatic heating service. All you do is set the thermostat at the desired temperature in the fall and forget the furnace until spring. Gas heat takes care of the rest—supplying clean heat of even temperatures all winter long. Get a free heating survey made of your home now and find out how reasonable is the cost of this most convenient heating method.
Cease Firing
HEAT WITH GAS
The Gas Company
GAS DOESN'T COST ... IT PAYS

The convenience of Gas House Heating with its automatic control is simply illustrated in a three column 12 inch ad. The spot cut, "Cease Firing," appears in all house heating ads of this Company along with the slogan, "Gas doesn't Cost —it Pays."

Classifications:

Public service company advertising generally falls under three classifications: Advertising to sell service, to sell various trade-mark lines of merchandise and to secure favorable public opinion. The third classification sometimes called "institutional" or "good will" advertising is in most cases a misnomer; because as a rule, it is written to please the man who pays for it, to glorify, him or the institution he represents rather than to inform the reader in simple language why his interests are the advertiser's interest. The American public is fickle and forgets quickly. Today's newspaper is tomorrow's history and any advertising that does not immediately intrigue the interest of the reader by a "what it will do for you" accomplishes little.

Types of Advertising employed by the average public service company are as follows:

A MODERN Gas Range
Costs Less to Buy... Costs Less to Use!
...AND 2 DOZEN FLAKY BISCUITS —done in a jiffy!
...AND 4 POUNDS OF GOLDEN SQUASH!
...AND 12 MEALY BAKED POTATOES
...AND 3 QUARTS OF GREEN BEANS
...AND ONE QUART OF CRANBERRIES
...AND 5 CUPS OF DELICIOUS COFFEE
...AND A 7 POUND BEEF ROAST DONE TO A TURN without basting— without watching
...AND A CREAMY LEMON PIE... The kind mother used to make!
TWO QUARTS OF SAVORY VEGETABLE SOUP... UMM!
7½¢ COOKS ALL THIS
...with a Modern Gas Range
BOTH HOMEMAKERS AND FAMOUS CHEFS agree
"It takes a Gas Range to Cook Good Meals"
THAT'S WHY CHICAGO FAMILIES BOUGHT
122,100 MODERN GAS RANGES
in the past 24 months from stores throughout the city!
And NOW... Even More Startling News!
MODERN COOKERY . . CONSTANT HOT WATER . . SILENT REFRIGERATION . . GAS HEATING
THE PEOPLES GAS LIGHT AND COKE COMPANY

Low cost is the prevailing motif in this full page newspaper ad (17 x 22). Gas Range sales through dealers over a period of two years are featured.

1. Newspaper Advertising
2. Direct Mail Advertising
3. Salesmen's and store literature
4. Window and store displays and display cards
5. Outdoor poster advertising
6. Special or feature page (newspaper) advertising
7. Program and year book advertising
8. Premium advertising
9. Radio advertising
10. Film advertising
11. Demonstrations
12. Miscellaneous

How and What Is Used:

Newspaper Advertising: The major expenditure for advertising is made for newspaper space. Fully 90% of this expenditure is used to promote the sale of merchandise and consists mainly of advertisements prepared by the manufacturers and supplied the public service company in mat form. This advertising is in the main designed to sell a trademark product. It deals particularly in mechanical features. It is usually set in small type, crowding the advertisement and dominated with a trade mark or manufacturer's name or emblem.

Direct Mail: Direct Mail, Salesmen's and Store Literature as well as Window and Store Displays are designed along the same lines and supplied from the same sources with the exception of direct mail pieces which are usually provided with space for imprinting terms or a short sales message and the company's signature.

Outdoor Advertising: Posters are also designed to promote a trade mark line, the utility tie-in consisting of a signature streamer.

Special Feature: Special editions of newspapers, program space and space in year books are many and should not in our opinion be classed as advertising for they are usually hastily prepared and infrequently read and for that reason should be regarded as donations. They have no value like all other sops.

Premium Advertising is usually some useless gadget given customers for supplying the names of prospective purchasers of merchandise or as an inducement to prospects to purchase. The idea of their use is outmoded as the purchaser is fully aware of the fact that their cost is included in the purchase price if they have any value or utility.

Radio Advertising usually consists of "spot" advertising to feature a particular item of merchandise for a limited period of time. In most cases public service companies find that

All-Gas Model Kitchens are powerful publicity and sales factors.

there is too much waste circulation in this type of advertising to make it profitable unless they operate in one of the metropolitan areas.

Film Advertising usually consists of a "trailer" produced by and featuring some particular manufacturer's product. The purchaser of a theatre ticket is seeking entertainment and this type of advertising as a whole is poorly and unfavorably received.

Demonstrations:

These are of two types;—one where the utility stages the demonstration to introduce or further exploit various products through usage of service, or one wherein a manufacturer cooperates to feature usage of a particular product or products. Demonstrations for sales people do not come under the classification of advertising.

Comment:

It is our opinion that the average utility would do well to confine its expenditure for advertising to the following media and in the order named:

1. Newspaper advertising
2. Direct mail
3. Window and store display advertising
4. Salesmen's and store literature
5. Poster or outdoor (illuminated) advertising
6. Demonstrations

Newspaper Advertising: To be most productive, newspaper advertising should be of two types—that featuring trade-mark products on which the manufacturer participates and purely company advertising, written, laid out, illustrated and scheduled by the utility.

Window and store displays should also be created by the utility with occasional use of "free" displays supplied by the manufacturer and designed to feature a particular item or items of merchandise offered for sale.

Salesmen's Literature should be selected and purchased from manufacturers' samples in 95% of the cases. This literature is produced in colors, profusely illustrated and lowered in cost through quantity production, usually prohibitive to a single operation.

Posters should be designed, produced and scheduled for posting by the utility with supplemental usage of manufacturer's posters.

Demonstrations should be conducted generally by the company and occasionally in cooperation with other agencies such as newspapers, provided no particular axe is to be ground and the utility's participation is on an equal basis with other participants.

Other forms of advertising should be given consideration only upon the basis of build-up, cost of participation and probable results accruing therefrom. Under this head may come participation in civic and community activities which assist in solidifying favorable public opinion.

Advertising Support:

Newspaper advertising should be supported by all other forms of advertising; window and store displays, tie-ins, direct mail, salesmen's and store literature should be available on products being advertised and stocked. Formats should be kindred though differing in size of space occupied which in turn would be predicated on coverage of the media employed.

It is our opinion that appreciable results in the way of merchandise sales, sales of service and company good will may be attained to say nothing of thousands of dollars saved annually by a synchronized program for the preparation, production and scheduling of all advertising. All of the material recommended might be so designed that it could be employed by associated companies by the simple expedient of a signature change. If so employed, its value would be further enhanced through wider circulation and continuity and larger quantity production with the resultant lower costs.

Gas Heat Costs Less Than You Think!
Don't just guess about the cost of heating your home with gas! Let us make an accurate estimate for you without charge or obligation. Learn how economical Gas Heat really is. Then enjoy its many advantages in your home next winter.
As easy to operate as a radio
PLAN TO
Heat
WITH
Gas
The extras you get with Gas Heat are worth many times over its slight additional cost.
There's extra convenience, because Gas Heat is automatic.
There's extra comfort, because you get just the temperature you want.
There's extra healthfulness, because with Gas Heat you have uniform temperature which doctors everywhere agree is an important health safeguard.
There are many other advantages of Gas Heat, too. It's clean. It saves time and work. It gives you an extra room in the basement. It is quiet, simple to operate and always dependable.
Temperature always just right
RENT A GAS CONVERSION BURNER FOR ONLY $2.95 PER MONTH
There's a type and size to fit any furnace or boiler
Let us make a FREE survey and estimate of your Home Heating Requirements.
ILLINOIS IOWA POWER COMPANY

In this 10 inch 3 column newspaper advertisement, comfort, ease of operation and low cost of gas heating are well featured. The human interest angle dominates.

The Value of the Water Heating Load

Winter Water Heating Increment

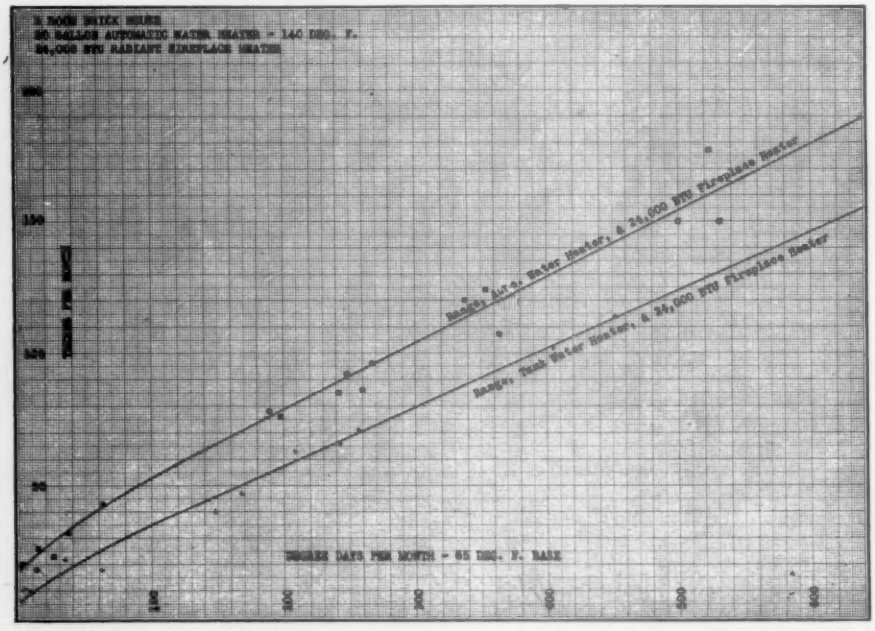
PART 2

By

By William H. Howe

Commercial Manager
The Tucson Gas, Electric Light & Power Co.
Tucson, Arizona

THE determination of the winter water heating increment is quite another set of conditions, for here we have the space heating increment entering our analyses. Taking the case of the writer, we have specific data for two years of cooking, tank water heater, and space heating, together with two years of data under identically the same conditions in the same house but with an automatic water heater in place of the tank water heater. Plotting the respective monthly gas consumptions against known degree day deficiencies, we obtain two curves showing



These curves show increase in gas consumption after automatic water heater replaced tank heater.

very definitely and decidedly a healthy increase in gas consumption after the automatic water heater replaced the tank heater. These curves and their respective points of determination are shown herein. Theoretically, these curves should be straight lines and we attribute the curved portions of the lower ends to the use of a 65 degree base rather than 68 degrees. Experience in this locality indicates that heating is required when the mean daily temperature falls below 68 degrees rather than the usual 65 degrees, which is the commonly accepted figure. Due to the very low relative humidity conditions prevailing in this southwestern desert region, a higher dry bulb temperature is required to attain a given effective temperature.

Knowing the normal degree day deficiencies for the respective months of the year, we have taken values from these curves to determine the average water heating increments. While our calculations (page 15, June issue) indicate a summer usage of 6.67 therms per month for cooking and manual water heating, there is no way of determining what each may have amounted to. We have, therefore, arbitrarily allocated 3 therms per month for cooking and 4 therms per month for manual water heating during the summer months. Since the mean daily temperature in the peak of the summer season is very close to 90 degrees and drops to about 50 degrees in the middle of the winter season, we have increased the peak winter increments to 6 therms and 9 therms per month for cooking and manual water heating, respectively.

We here show in tabular detail our estimate of the respective increments for cooking, manual water heating, and automatic water heating through the twelve months of the year. Summarizing, briefly, we find this analysis indicates the following pertinent data:

Appliance	*Therms/Yr.*	*Increment Gross Rev./Year*
Range	50	$11.00
Manual Water Heater	71	14.50
Auto. Water Heater	281	43.18

It is obvious and otherwise apparent that every home using gas for cooking will use gas for heating water in one form or another and a superficial inspection of the foregoing data indicates an automatic water heater will use approximately four times the amount of fuel and produce about three times the amount of gross revenue that a manual water heating job will do. Herein lies the proof that an automatic water heater educates the public to the use and value of hot water service. We have yet to meet the person who would willingly change from an automatic water heater to other forms of water heating. (See Chart)

Value of the Water Heating Load

Since it is apparent the average home, not now using an automatic water heater, would spend $14.50 per year for heating water in one form or another, the incremental value of the automatic water heater is, therefore, the difference in gross revenues, or $28.68 per year.

The additional net revenue of the automatic water heater is determined as follows:

Gross Revenue Auto. W. H.....	$43.18	
Gross Revenue Tank	14.50	
Difference	$28.68	$28.68
Cost of Gas—Auto. W. H. 281 Therms @ 4c...	$11.24	
Cost of Gas—Tank W. H. 71 Therms @ 4c	$ 2.84	
210 Therms @ 4c..	$8.40	
1 Service Call per year for Auto. W. H. @ $1.50..	$ 1.50	
Estimated Addit. Cost to Serve...	$ 9.90	$ 9.90
Additional Net Revenue		$18.78

In the foregoing analysis, we have assumed the automatic water heater to be a purely incremental load, aside from one additional service call per year, which is not without the realm of reason. In this state, the Arizona Corporation Commission considers a fair return to be 6½% on invested capital for utilities. Now, if we capitalize this additional net revenue of $18.78 per year at the rate of 6½% per annum we find the value of the automatic water heater as follows:

$$\frac{\$18.78}{.065} \text{ or } \$289$$

It should be borne in mind the foregoing figure is the value of the automatic water heater load over and above other forms of water heating and the true and full value of the automatic water heater would be greater than this figure.

Estimate of Increment Gross Revenues

Month	Est. Therms Cooking	Est. Therms Tank W.H.	Addit. Therms Auto. W.H.	Total Therms Auto. W.H.	Increment Revenue Cooking	Increment Rev. Tank W.H.	Increment Rev. Auto. W.H.
January	6	9	30	39	$1.32	$1.63	$4.78
February	5	8	25	33	1.10	1.55	4.58
March	5	7	22	29	1.10	1.40	4.34
April	4	6	16	22	0.88	1.32	3.72
May	3	5	13	18	0.66	1.10	3.19
June	3	4	10	14	0.66	0.88	2.59
July	3	4	10	14	0.66	0.88	2.59
August	3	4	10	14	0.66	0.88	2.59
September	3	4	10	14	0.66	0.88	2.59
October	4	5	14	19	0.88	1.10	3.27
November	5	7	22	29	1.10	1.40	4.34
December	6	8	28	36	1.32	1.48	4.60
Totals	50	71	210	281	$11.00	$14.50	$43.18
Avg.	4	6	17.5	23.4	$ 0.92	$ 1.21	$ 3.60

General Gas Rate

First 10 therms per month @ 22c per therm
Next 20 " " " @ 15c " "
Over 30 " " " @ 6c " "
Minimum: $1.00 per meter per month.

Gross Revenue Auto W. H.	$43.18	$43.18
Cost of Gas—281 Therms @ 4c...	11.24	
1 Service Call @ $1.50.....	1.50	
Cost of Serving...	$12.74	$12.74
Net Revenue.....		$30.44

* * *

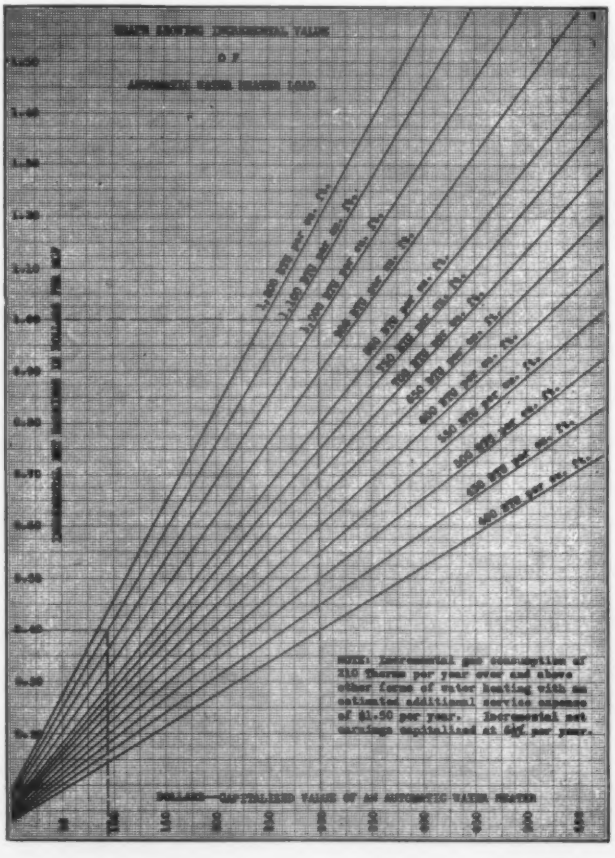
Gross Revenue Tank W. H.	$14.50	$14.50
Cost of Gas—71 Therms @ 4c...	2.84	2.84
Net Revenue.....	$11.66	$11.66

* * *

Capitalizing these respective net revenues at 6½%, we obtain the following:

$$\text{Tank Water Heater: } \frac{\$11.66}{.065} \text{ or } \$179$$

$$\text{Auto. Water Heater: } \frac{\$30.44}{.065} \text{ or } \$468$$


Gain Showing Incremental Value
of
Automatic Water Heater Load
Dollars—Capitalized Value of an Automatic Water Heater

This graph shows incremental value of water heating load.

Estimate of Additional Use of Gas Automatic Water Heater Compared to Manual Heater

(From Curves on adjoining chart)

Month	(x) Normal Degree Days	Therms Range. Auto. W.H. & F.P. Htr.	Therms Range Tank. W.H. & F.P. Htr.	Therms Diff.
Jan. ..	515	158	128	30
Feb. ..	323	110	85	25
Mar. ..	238	88	66	22
Apr. ..	78	46	30	16
May ..	20	26	13	13
June ..	0	14	4	10
July ..	0	14	4	10
Aug. ..	0	14	4	10
Sept. ..	0	14	4	10
Oct. ..	31	31	17	14
Nov. ..	245	90	68	22
Dec. ..	435	138	110	28
Totals	1,885	743	533	210

(x) 65 Deg. F. Base
10 Yr. Average of 1928-38

The foregoing study of the volume and value of the water heating load covers the specific conditions as we find them in our particular locality with respect to saturation of automatic water heaters, the structure of the generally applicable rate with reference to the water heating increment, and the average use of hot water in the home. Conditions in other localities may be expected to vary widely with relation to the three variable factors enumerated above and the determination of the value of the water heating load, particularly the automatic water heater, requires, therefore, a detailed analysis of these three variables.

We have already shown the annual consumption of side arm and other forms of manual water heaters at 71 therms with 281 therms for an automatic water heater, a difference of 210 therms per year in favor of the automatic water heater. Additional service expense of the automatic water heater has been estimated at $1.50 per year, which is probably high.

Now, if incremental sales were at 65c per MCF for 1,100 BTU gas costing, let us say, 30c per MCF with net earnings at 35c per MCF, we find the net revenue for an increment of 210 therms to be $6.68 less $1.50 estimated for service expense or $5.18 per year which, when capitalized at 6½% per year, gives us a value of $79.69. If the cost of gas is only 20c per MCF, we have incremental earnings of 45c per MCF and, similarly, we find the capitalized value of the automatic water heater to be $109.09.

We here show a graph giving the capitalized value of the automatic water heating load based upon an incremental gas consumption of 210 therms per year over and above other forms of water heating and an estimated additional annual service expense of $1.50 per year for various incremental net earnings per MCF and various BTU gas contents which we believe is self-explanatory. For other increments of usage above or below 210 therms per year or other rates of capitalization, the value of the automatic water heater varies accordingly.

From the foregoing analysis, we have gained some idea of the value of the water heating load, particularly the automatic water heater, which may appear to be somewhat startling, and yet, here is a purely incremental load with the highly desirable qualities of modest demand and relatively high load factor of which many of us in the gas industry may never have had a true perspective—particularly its relation to an integrated load building program. In our many and varied promotional activities, perhaps, we might give some further consideration to the value of the automatic water heaters.

How the Water Heating Load May Be Secured

With the given premise of an almost endless number of ways of securing the water heating load, we turn our thoughts and consideration to evolving a promotional program which will fit our own particular conditions. It should be borne in mind, however, that one program which might prove highly effective in one locality may prove to be a total loss in some other community and vice versa.

In reviewing the remarkable gains of the electric industry during the past decade, one of the salient and remarkable features is, undoubtedly, the factor of dramatization which has been so inseparably linked with their promotional programs. Now, electric service is intangible to the extent that a kilowatt-hour of energy is not readily visible or perceptible to the casual observer; but, what the kilowatt-hour will do in serving the needs and desires of mankind must be apparent to all of us. Here we have, therefore, the case of intangible selling as has been exemplified in the electric industry and whether we, in the gas industry, like it or not, we will have to admit they have done a splendid job. Dramatization of electric energy with particular respect to the many chores it will do in the average household to lighten its routine burden is, to a large extent, the answer of the gains made by the electric industry and should give us some worthwhile ideas for a promotional program in the gas industry.

The promotional program which we are outlining herein is given from our own actual experience, and, in no sense of the word, is offered as a panacea or cure-all. What success we may have achieved is best known by the graph of the summer months' domestic load (shown on page 15, June issue). Specifically, we find the summer usage has been increased from approximately 20 MCF per year to more than 28 MCF per year or about 40% increase. As previously stated, while this program may have been a success in Tucson, Arizona, it does not follow, necessarily, these conditions would obtain elsewhere and we merely offer this outline for whatever assistance it may be to others in the gas industry.

At the time of the change-over to natural gas in 1934, and bearing in mind the fact our domestic consumption was far below the national average, considerable thought was given to ways and means of building up this deficiency. It was evident a large space heating increment could readily be attached in view of fuel oil selling at 8c to 10c per gallon and soft coal at $15.00 per ton. With a comparatively warm winter climate, averaging less than 2,000 degree-days per year, it was apparent considerable promotion would be required to attach the intermediate load of water heating and, more specifically, the automatic water heater since this saturation was very low at that time. In other words, here is the job of educating the consumer to the desirability, need, and dependability of 24-hour automatic hot water service.

In evolving our promotional program for the drive on the automatic water heating load, it is obvious there are many factors affecting the composite picture in attaching the automatic water heating load. First of all, and of primary importance, is selling the value of 24-hour hot water service and creating a desire in the mind of the prospect for such service. Second, is real selling effort on the part of the salesman to go out and sell which we find is activated by the profit motive and requires, therefore, a return for his services not only commensurate with his efforts, but something in addition to retain his incentive and drive to continue selling automatic water heaters.

With these two basic factors in mind, we considered the following procedure:

1. **A co-ordinated and continuing advertising program to educate the prospect on the value and need for 24 hour hot water service. An occasional contest in the form of word puzzles with awards to the winners to retain general public interest.**

2. **Getting the dealer and salesman to advertise and talk automatic water heaters.**
3. **Financing purchases of water heaters on the easiest and simplest possible terms for the buyer.**
4. **Taking the old tank or side-arm heater off the hands of the purchaser and the dealer.**
5. **Good remuneration for the salesman on the firing line. He is the last link in the chain of events and if he fails, we too, will fail in our promotion.**

With the foregoing factors in mind, we presented the following program of co-operation to the dealers and plumbers which was greeted with 100% acceptance.

1. **The utility will continue its coordinated program of advertising automatic water heaters. Our advertising display department is available to each and every plumber and dealer to assist you in laying out your own advertising at no charge.**
2. **The utility will pay the dealer an advertising allowance of $2.00 for each automatic water heater sold provided the dealer or plumber will put $1.00 with such sum. In other words, the utility will stand up to two-thirds of the dealer's specific advertising.**
3. **The utility will finance the sales of automatic water heaters by the dealers at no charge or discount up to 24 months with 10% down payment and carrying charges on the unpaid balance at one-half of one per cent per month. Monthly instalments will be shown on purchaser's monthly bill for gas service.**
4. **An allowance of $2.50 each will be made by the utility to the dealer for each tank or side-arm water heater taken in trade by the dealer in the sale of an automatic water heater when delivered at our warehouse.**
5. **The utility will pay the dealer $1.00 for the city permit necessary in the installation of an automatic water heater.**
6. **The utility will pay the dealer's salesmen $5.00 each as a bonus for the sale of automatic water heaters.**

While the first five items of this promotional program were put into effect in the early part of 1934, at the time of the change-over to natural gas, it was not until the fall of 1936 that the payment of the $5.00 bonus to dealer's salesmen was inaugurated. Referring to the graph on page 15, June issue, we find some increase in consumer consumption for 1935 over 1934, as might be expected. However, there is very little increase for 1936 over 1935 but after the bonus payments were put into effect, 1937 shows a healthy increase over 1936 which has been carried through into 1938. These data and the accompanying graph show a definite and decided increase in summer gas consumption after the inauguration of the salesmen's bonus. We are now more firmly convinced than ever that the salesman's bonus was the most effective promotion ever undertaken by this company.

In speaking before the Spring Sales Conference of the Pacific Coast Gas Association in April, 1937, the author outlined the foregoing promotional plan to the group and the reaction of some of those present was that we might be "giving our shirt away." Now tabulating these costs, we find:

$2.00—Dealer's Advertising allowance
2.50—Tank or side-arm trade-in
1.00—City installation permit
5.00—Salesman's Bonus

$10.50—Total

In addition to the foregoing, this company made expenditures for advertising of water heating over its own name to the extent of probably $1,000 per year. During the five years of 1934 through 1938, it is apparent some 2,200 automatic water heaters were added to our lines of which only about 70% were actually reported by the dealers. The remaining 30% is largely accounted for as installed by building contractors who would not ordinarily report to a utility.

Assuming this company spent $1,000 per year in advertising water heaters and paid the dealer $10.50 each on 70% of the heaters actually installed, we find the approximate average cost of attaching this load as follows:

2,200 x $10.50 x 70% ..	$16,170
5 Yrs Adv. @ $1,000 ...	5,000
2,200 Water Htrs. @ $9.62	$21,170

We have previously shown the capitalized incremental value of an automatic water heater at $289 on page 11, herein and it is obvious, therefore, we were paying in the form of promotion about 3⅓% of the capitalized value of the load or about 31.6% of the first year's net revenue.

It is axiomatic that the proof of the pudding lies in the eating and the most tangible proof we have that our efforts were not in vain is best shown by the graph on page 15, June issue. Here we have seen a growth in our summer load from 20 MCF per year to more than 28 MCF or more than 40%; in addition, there has been a decided increase in number of consumers from a low of 4,108 in the summer of 1933 to 6,275 in 1938 which amounts to nearly 53%. The compounded and composite picture, therefore, is that the total summer gas consumption has been increased nearly 106%.

There are other factors of value, tangible and otherwise, inhering to the automatic water heating load which are difficult of evaluation. One pertinent factor we have noted is that it not only builds good will, from the splendid service it renders day in and day out, but almost invariably a space heating installation will be sold with or immediately after the sale of the water heater.

Whether or not the water heating load, more particularly the automatic water heater, is desirable from the standpoint of the utility, there can be little doubt. On the other hand, here is a neglected child which, if fed and clothed, might develop into a husky adult.

Some Notes on Competition From Electric Water Heaters

In the Pacific Coast area, notably Los Angeles and Southern California, with the advent of Boulder Dam hydro-electric power being sold by the Bureau of Power & Light, municipal electric utility in the City of Los Angeles, electric energy for water heating is being made available at the almost unbelievably low figure of 7 mills per kilowatt-hour. To say the least, some inroads on the water heating load have been made and it is a matter of serious concern to the gas industry in Southern California.

In our several contacts with various members of the Pacific Coast Gas Association, we have discussed this matter at considerable length to gain some idea of their problem.

Now, there is nothing mysterious about the heating value of a kilowatt-hour of electric energy; as a matter of fact, it has a heating value of 3,415 BTU compared to a million BTU for each MCF of natural gas having a gross heating value of 1,000 BTU per cubic foot. Obviously, there are certain losses resultant to the combustion of natural gas and generally accepted data indicate a gas-fired automatic water heater may be expected to show 70% to 75% efficiency through its heating cycle.

Admittedly, the efficiency of an electric heating element is high, since

there are no losses incident to combustion and we might assume, for the sake of comparison, that the heat transfer from an electric heating element is perfect and there are, therefore, no losses of any description. Based upon the foregoing premises, we find it will require 205 kilowatt-hours of electric energy to replace each MCF of 1,000 BTU natural gas or 20.5 kilowatt-hours per therm in an automatic water heater.

On this page we show our analysis of the comparative economics of an automatic water heater using 1,135 BTU natural gas at 65c per MCF and a similar electric water heater with electric energy available at 7 mills per kilowatt-hour.

In the Los Angeles area, we are advised that 40-gallon automatic storage electric water heaters are available at an average installed cost of $90.00 with water piping and heavy duty electric wiring being furnished free to the customer. These electric water heaters have heating elements of 2,500 watts and 1,250 watts, respectively, or a total of 3,750 watts of capacity. The average gas-fired automatic water heater has a capacity of 20 gallons with a heating input of 20,000 BTU per hour and sells for $60.00 installed.

In making our study of the comparative economics involved, operating costs include not only the cost of the heat input, but amortization of the respective investments based upon a life of 60 months with interest at 6% per annum. In this connection, it should be noted that amortization is as much a part of the operating costs as any other element entering therein. Figuring amortization at 1.93% per month, based upon an estimated life of 60 months with interest at 6% per annum, we have a fixed charge of $1.74 per month for the electric water heater and $1.16 per month for the gas-fired water heater. This difference of $0.58 per month in fixed charges accounts for the fact that electric energy could be given away at no cost to the consumer, and 1,100 BTU gas could sell for 28c per MCF to show the same overall cost of operation as an electric water heater in similar service.

Summarizing, briefly, this study indicates electric energy at 7 mills per kilowatt hour in an automatic storage water heater will cost more than twice as much as 1,135 BTU natural gas at 65c per MCF.

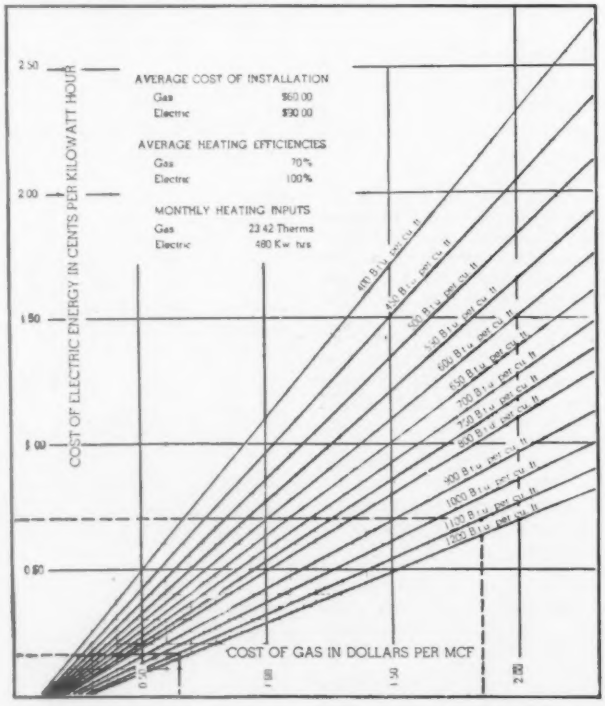
We show herewith a graph of equal operating costs of gas vs. electric water heaters with various costs for the respective services and various heating values of gas which we believe is self-explanatory.

Estimated Operating Costs Per Month

(Based upon average of 2065 cu. ft. per mo.)
(1,135 Btu per cu. ft.)

	Gas	Electricity
Amortization of Investment @ 1.93% (*)	$1.16	$1.74
Cost of Gas—2,065 MCF @ 65c	1.34	....
Cost of Elec.—480 KWH @ 7 mills	....	3.36
Total Cost of Operation	$2.50	$5.10

** 60 mo. life with interest @ 6% per annum.*



Equal cost of operation graph, gas versus electricity, for automatic storage water heaters, based on B.t.u. operating ratio of 1.43 and 1 for gas as compared to electricity. Operating costs include amortization of investment at 1.93 per cent per month based upon life of 60 months with interest at 6 per cent per annum.

Comparative Costs of Operation of Automatic Water Heaters
Natural gas @ 60c Per MCF vs. Electricity @ 7 Mills Per KWH

	Gas	Electricity
Storage Capacity—Gallons	20	40
Approx. Installed Cost	$60	$90
Approx. Heating Input	20,000 BTU	3,750 Watts
Approx. Heating Efficiency	70%	100%
Effective Heat Input	14,000 BTU	12,806 BTU
Recovery—Gals./Hr. @ 60° F. Rise	28.0	25.6

With an analysis of the comparative economics, it is obvious there is but one solution to the problem insofar as the gas industry is concerned. We are going to have to get out and toot our own horn, do a real selling job based upon cold facts and realities rather than mystery and glamour; and we are not yet convinced that the gas industry cannot and will not do it.

Summary

Recovery: 9.4% Greater for average gas heater.

Operating Costs: 104% higher for electric heater.

Conclusions

Assuming that an electric water heater is 100% efficient in its heating cycle and that an automatic gas-fired water heater has an efficiency of only 70% in its heating cycle, it will require 205 KWH to replace each MCF of gas at 1,000 BTU every cu.ft. Considering fuel and amortization of investment, electric energy must be available at 1.58 mills per KWH to show a lower operating cost than gas at 65c per MCF.

Sales Principles of a New-Business Manager

Facts From an Interview With a Successful Sales Director

by
Special Correspondent

Jack Torbert

The genial, new-business manager of the Wyandotte County Gas company, a Cities Service unit located in Kansas City, Kansas, would be an asset to any firm. He's Jack Torbert, one of the most popular men in this city of 125,000 population. Now in his eleventh year with the Wyandotte County Gas company and in his seventeenth year in the gas industry the sales of gas appliances have always been exceedingly good wherever he has been around. And with a sincere modesty he credits the outstanding sales results to the men under him. This writer, however, knows that any salesman would work his fingers to that proverbial bone for such an appreciative "boss."

Mr. Torbert, in turn, is exceptionally proud of the men he has worked under. Carl O. Brown, now district manager of the General Electric Appliance company at New Orleans, offered him a job when he was "legging" it as a reporter for the Miami, Oklahoma Record-Herald in 1922. Mr. Brown, then new business manager for the Consumers Gas company in Miami was attracted to Mr. Torbert's personality on meeting him as a newshawk. Mr. Torbert was hesitant about leaving the hustle and bustle of the exciting newspaper world but Mr. Brown's offer was too tempting to pass up.

Working for three years as a gas appliance salesman in Miami, Okla., Mr. Torbert went to a similar post in Wichita, Kansas, in June of 1925. One year later he was elevated to the position of new business manager for the Newton, Kansas company and then in 1928 was named head of the sales force of the company in the largest city of Kansas.

The second "boss" of whom Mr. Torbert is exceptionally proud is W. H. McKenzie, general manager of the Wyandotte County Gas company and one of the oldest men, in point of service, in the natural gas company today. "Mr. Mac," as Mr. Torbert always refers to him, celebrated his sixtieth year in the natural gas business in 1936 and is still active. He is one of the four charter members of the Natural Gas division of the American Gas Association now living and was one of the honored guests when the Natural Gas Division met in Tulsa, Oklahoma, in May.

Honors have been heaped upon the head of Mr. Torbert so frequently during the past year that he is going to have to begin selling gas appliances between meetings. But we'll wager that he can still take care of his civic responsibilities and continue to increase sales. On April 7 he was elected president of the Kansas City, Kansas, Chamber of Commerce. In July he will finish his term as district governor for the Lions Club of the eastern half of Kansas. This fall he will be general chairman of the important Community Chest drive.

One of Mr. Torbert's sales ideas has been copied from coast to coast. It's no new thing, of course, to give turkeys away at Christmas time with the sale of each gas range. But instead of buying the birds wholesale and saving a few cents, he believed it would be a better investment to tell the person buying the range they could get their turkey free from their own grocer. You can well imagine the joy of the grocers over such an idea and the Kansas Retail Grocers Association publicized the fact throughout the state.

At 44, the new-business manager is a literal high flier as well as figuratively speaking in sales. Mr. Torbert, slightly stout and slightly bald, has a decided desire to buy a plane and pilot it. He does nearly all of his traveling by the airlines but is constantly talking about the time he can "sell the east eighty and buy a plane." Occasionally unconsciously slipping into a slight southern drawl he credits it not to his birthplace, Sheldon, Mo., but to the years he spent in Oklahoma. He is a former student of the University of Oklahoma.

Both Mr. McKenzie and Mr. Torbert have worked for a close dealer cooperation in appliance merchandising and excellent sales results have been obtained. The company has about 25,000 customers and twenty salesmen work under Mr. Torbert. Women employed by the home service department of the Wyandotte County Gas company make home calls on each new range purchased from the dealer, the same as if the range was purchased through the company. Home service department employees attempt to call on every new range customer within a week following the installation of the range, offering to aid the housewife in the proper use of the range and showing her how to solve any cooking or baking problem she may have.

CP Range Regional Managers To Meet at World's Fair in July

The Certified Performance Range Program, sponsored by the Domestic Range Committee, was officially inaugurated on August 1, 1938. The first Annual Meeting of the Regional and Associate Regional Managers of this Program will be held in the Auditorium of Gas Industries Building at the New York World's Fair on Wednesday and Thursday, July 12 and 13. The Domestic Range Committee will meet on the day previous.

Thursday afternoon will be devoted to the inspection of exhibits of industries allied with our industry as well as those of competitive groups.

ROPER

GAS RANGE

OLD STOVE ROUND-UP SALE

A Field-Tested Sales Plan

STREAMLINED

FOR YOU—NOW!

LET THE 4 ROPER RANGERS STEP UP SALES

Eleven years ago Roper originated the Old Stove Round-Up plan. Year after year since then many Roper outlets have used the Round-Up with splendid success.

While retaining all of the soundness and appeal of the original Round-Up idea, the current campaign is fresh and interesting. The Round-Up Sale continues as one of the finest merchandising plans ever conceived.

These four hard-ridin' straight-shootin' Roper Rangers will help you conduct an outstanding gas range sale featuring new Ropers.

If you have not received the complete Roper Old Stove Round-Up Sale presentation, write for it today. You'll find newspaper ads, display, pennants, streamers, envelope inserts, dodgers, contest suggestions, and many other worthwhile items available for your immediate use. The Roper Round-Up Sale will help you hit a new high in gas range selling. Try it.

GEO. D. ROPER CORPORATION

GENERAL SALES OFFICE AND PLANT: ROCKFORD, ILL.

WAREHOUSES:

Chicago: 343 So. Dearborn Street—Atlanta: 901 William Oliver Building—Los Angeles: 2481 Porter Street
Dallas—Cincinnati—Brooklyn—Danbury, Conn.—San Francisco—Kansas City—Newark—Boston
Washington—Cleveland—Philadelphia—Roanoke

USE ROPER SALES PROMOTION PLANS

ROPER RANGES ARE IDEAL FOR USE WITH ANY TYPE OF GAS, INCLUDING BOTTLED GAS

Gas on Parade at New York World's Fair

Gas Exhibits Attract Many Thousands of Visitors Daily

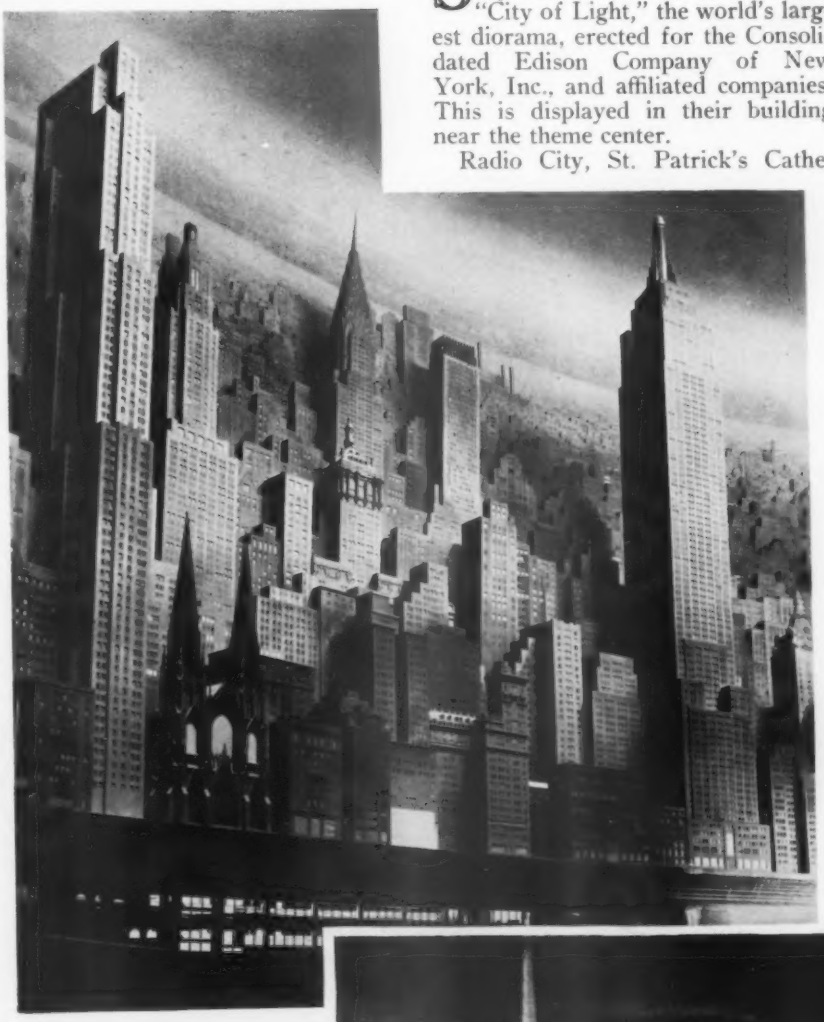
SKYSCRAPER masses form the skyline of New York in the "City of Light," the world's largest diorama, erected for the Consolidated Edison Company of New York, Inc., and affiliated companies. This is displayed in their building near the theme center.

Radio City, St. Patrick's Cathedral, New York Central, Chrysler, Chanin and Empire State building models are shown in this view of the mid-Manhattan section of the 4,000-building diorama which reproduces the metropolitan area from upper Westchester to Coney Island. Higher than a three-story building, the exhibit is nearly as long as a city block. Its thousands of electric lights provide a constantly changing spectacle, with dawn, mid-day, afternoon, twilight and night effects following one another in each performance. A sound recording synchronized with the changing lights tells the story of Edison Co. and affiliates' gas, electric and steam services.

The "Water ballet" facade for the exposition building is also a striking feature of the Consolidated Edison Company displays. The building's entire 9,000-square foot facade is sculptured in water by a fountain colonnade, formed by the discharge of 40,000 gallons of water an hour to a height of forty-two feet.

Staged in the reflecting pool which rims the structure, a water ballet climaxes the spectacle. A bridge passes through the water wall into the building, which houses the "City of Light."

The first of its kind ever erected, the facade was designed by Harrison & Fouilhoux, architects. Alexander Calder, sculptor, executed the water ballet. H. L. Cooper, chief hydraulic engineer, New York World's Fair, Inc., designed the mechanical equipment.



Gas Industries Building

The gas industries building is devoted exclusively to its displays and functions. The building is located on the Avenue of Patriots at Fireside Row, about one-third of the distance from Bowling Green to the Theme Centre. It is located a short distance south east of the I.R.T.-B.M.T. subway station and the Long Island Railroad gate.

Above: The mid-Manhattan section of the animated "City of Light." To the right:—Artist's drawing of "Water Ballet," a fountain colonnade discharging 40,000 gallons of water an hour to a height of 42 feet and illuminated at night.

Exhibits in the Gas Industries Building

(See opposite page)

Court of Flame

The Court of Flame is located at the entrance to the Gas Industries Building. It is surrounded by four 90-foot pylons, each of which represents a major use of gas in the home. The pylons are bathed in gas flames rising to their full height. At the base of each pylon is a diorama depicting one of the four major uses of gas. In the center of the court a 10-foot cube with mirror surfaces is surmounted by a great gas flare.

Exhibition Hall

One part of the Gas Industries Building is devoted to animated exhibits dramatizing the four chief domestic uses of gas—for cooking, refrigeration, water heating and house heating, as well as air conditioning and commercial and industrial applications of gas. Twenty manufacturers are represented in these exhibits.

The Theatre

Across the Court of Flame from the entrance to the Exhibition Hall is a theatre capable of seating 300 persons. In this theatre there are daily lectures and demonstrations by George Rector, the well known restaurateur. Opera presentations by the Victor Puppet Company give abridged grand opera, the puppet acting being synchronized to recordings of popular grand operas. A special cook book has been prepared by Mr. Rector, autographed copies of which are sold at a moderate price.

All-Gas Model Home

"Homewood," the all-gas Good Housekeeping home which stands in a beautifully landscaped area adjoining the Gas Industries Building has been described in the April issue of AMERICAN GAS JOURNAL.

Free Admission

No admission charge will be made for any of the lectures, demonstrations or entertainments in the Gas Industries Theatre or for admission to the Exhibition Hall or the Model Home.

The Restaurant

A smart, strategically situated restaurant is part of the gas industry's "Court of Flame" exhibit.

The restaurant, which has an "All-Gas" kitchen entirely visible to the public, has a capacity of 660 people, with 400 places in the main

(Continued on page 20)

(1) The Bryant Heater Co. The exhibit of this Company features automatic gas heating equipment and shows in detail their unit heater, forced air heater, winter air conditioner and steam vapor and hot water boiler. A large model of an automatic control valve for gas heating is displayed on the right of the booth.

(2) Detroit - Michigan Stove Co. shows the Garland Commercial Gas Range and Detroit-Jewel and Garland Domestic Ranges, including CP models. Attention is drawn to the fact that this Company is now in its 75th year of service to American homes.

(3) Glenwood Range Co. shows their new 1939 line in the Gas Industries Building, Space 28, New York World's Fair. Glenwood features in their exhibit demonstration equipment to prove the speed, economy and dependability of gas for cooking. A complete Monel Metal kitchen includes Glenwood's new 800 "back-to-the-wall" model kitchen series. CP is given prominent emphasis in Glenwood's exhibit.

Photo-murals pertaining to gas cookery and new features are displayed, and a large photo-mural of the Glenwood factory and a play-up of Glenwood's 60th Anniversary Celebration in the field of high grade cooking appliances.

(4) Handley - Brown Heater Co. show their Mirro-Shell conversion low input and medium input conversion heaters and new fast recovery Mirro-Matic heaters and their U-Tube low input heaters. A cut-away model of the "Mirro-Matic," shows the new direct and indirect methods of heating, as well as a complete heater. They likewise show the HB Househeating Burner and the Handley Brown S-F Burner.

The ease with which a side arm heater and range boiler can be converted into an automatic gas water heater is shown by an ingenious arrangement. A full size view of a side arm heater and a tank heater are shown in a recessed opening and then the lights dim and as that view disappears in the same place a view of the range boiler converted into an automatic heater appears. This is done with an ingenious timing arrangement of lights and a transparent mirror. A large electric clock with faucets showing the hours is a part of the display.

(5) American Stove Company show their complete line of commercial and domestic ranges featuring especially the CP models and making good use of large lettering in relief displaying their trade name, "Magic Chef." Their slogan, "Look for the Red Wheel," is also featured throughout the exhibit. Commercial Ranges of this company may be seen in operation in the open kitchen of the Court of Flame Restaurant.

(6) The Estate Stove Co. Sound, light, color and motion — all the elements of modern showmanship are combined to produce a dramatic effect in The Estate Stove Company's exhibit.

On a stage built into the rear wall of the exhibit, a life-size figure of an ultra - modern young lady demonstrates the exclusive features of Estate Gas Ranges while a commentator's voice through concealed sound equipment presents 5-minute sales talks.

The spot-lighted offering of the gas range exhibit is the new "Claremont" Estate — Model 615-38. Features of this range include a new "Triple-Thick" cooking top, a chromium-plated instrument board in the mantel back which includes flue vent, interval timer and electrical convenience outlets, flush-to-the-wall cabinet, waist-high drawer broiler, Grid-All, simmer-speed cooking top burners. Monel Metal top and top covers are optional equipment.

(7) General Gas Light Co. show a comprehensive display of space heaters of many types attractively arranged on two revolving platforms. The central item shows a heater located in fireplace. Interesting photos of installations are freely used throughout this exhibit.

(8) Remington-Rand, Inc. This illustration shows part of the Remington - Rand Business Machines Systems exhibit. It is not located in the Gas Industries' Building, but occupies one entire side and end of the Electrical Products Building — Remington-Rand Hall — and is a 200-ft. panorama of the Remington-Rand contribution to the "World of Tomorrow." The entire exhibit occupies about 10,000 square feet of floor space.

GAS
GAS
GAS
GAS
GAS
GAS
GAS
FIRST IN THE FIELD OF
AUTOMATIC GAS
HEATING EQUIPMENT
BRYANT
1

5

DETROIT MICHIGAN STOVE COMPANY
DETROIT JEWEL GAS RANGES
GARLAND GAS RANGES
2

THE ESTATE STOVE CO
6

Glenwood
MAKES COOKING EASY
3

GENERAL GAS LIGHT COMPANY
HUPP
PRODUCTS
7

Hot water at all times
H-B "U" TUBE
WATER HEATER

8

Artist's drawing of the "Court of Flame" Restaurant. Chinese red dominates in the decorative scheme.

dining room, and 260 additional seats on the outdoor Garden Terrace. It has smart, modern appointments and prices are in the moderate range.

Some 150 employees are needed to operate the restaurant which is open from 10 in the morning until 10 at night. Luncheon, tea and dinner are served in the restaurant. It commands an impressive view of the spectacular "Court of Flame," focal point of the gas industries' exhibit group.

In addition to the dining facilities, there is a large "stand-up" bar 100 feet in length with a capacity for about 75 people.

There are four entrances: Two from the avenues surrounding the exhibit group; one from inside the main exhibit area where manufacturers' appliances are displayed and another from the tree-shaded patio where is "Homewood," the All-Gas, Good Housekeeping Home, described in our February and April issues.

Gas Exhibits—Continued

(*See opposite page*)

(1) George D. Roper Corp. The central item in this exhibit is a revolving platform showing the latest model CP ranges manufactured by this Company. Other Roper ranges in the CP group are displayed at intervals along both sides of the booth and the back. Above the back wall exhibit is a moving sign telling the features of Roper ranges.

(2) Ruud Manufacturing Company. This exhibit displays adequately the more popular numbers of the Ruud Water Heaters. Special display is made of the automatic gas water heater with the 20-year guaranteed Monel tank made in four sizes from 20 to 60 gallon capacity. In addition to this display, Ruud Heaters are used for service in a large number of the buildings throughout the Fair including the Gas Industries' Building itself, A. T. & T. Company, Borden Company, British Government Pavilion, Consolidated Edison, Continental Baking, New York State Building, Press and Post Office Building, Y.M.C.A., Police, Ford Motor Company, Administration Building, etc.

(3) The Tappan Stove Company. This Company gives special display to the Tappan "Divided Top" Gas Ranges, and also features "The Visiguide," a temperature scale for cooking mounted on the back of the range which shows at a glance the correct amount of time and temperature required for all kinds of cooking. In the color scheme, blue predominates being carried out in dark blue, light blue and red. Three discs a yard in diameter carry translight illustrations.

(4) Welsbach Company. Their exhibit shows Hot Zone Gas Water Heaters and has a number of transparencies showing modern, automatic and economical features of these units. The cut-away model in the foreground shows method of installation and interior details. In the central background the glass-enclosed life-sized figure depicts the water heating theme.

(5) L. J. Mueller Furnace Company feature "Levelized Heat," and display their automatic gas heaters and air conditioning equipment. Glass panels in the front of the units make the interior details and operation clear to the visitor.

(6) Surface Combustion Corporation shows in their central location a very complete exhibit of conversion burners, heating units and heat treating furnaces for industrial appliances. An attractive decorative background lends life to the entire exhibit.

(7-8) Robertshaw Thermostat Company. This exhibit is in the form of a miniature theatre. The exhibit itself is beautifully designed in the modern manner conforming with the architectural motif of the Gas Industries' Building. At the left of the exhibit there is a small stage. Periodically a curtain rises and animated dolls give a two-act play. These dolls are approximately 20 inches high.

The first scene shows a typical modern kitchen, and the second scene shows a restaurant view in which fully automatic gas appliances are the feature. Part of the decorative treatment of the back wall pertains to the romance of cookery, while part graphically portrays the freedom which is made possible to the housewife by the Gas Industry through the modern gas range. The insert (8) is one of animated scenes on the puppet stage.

(9-10) Servel, Inc. These illustrations show two of the ten dioramas which are scattered throughout the "Magic Cave of Ice," which constitutes the main exhibit of this Company, which was described in our April issue. Number 9 illustrates refrigeration in the Nineteenth Century, which was dependent on ice harvesting in the winter months. Number 10 is another of the dioramas which shows the "cave man and his kill," indicating the method used for the preservation of food at proper temperature in the days of the cave man. Other dioramas in this exhibit show Cleopatra's wine bearers, a well-house of the Massachusetts Pilgrims, the inconvenience of the old-fashioned ice-box and, finally, in contrast to these outmoded methods, the modern all-gas kitchen.

In the center of the Servel exhibit is a giant refrigerator twelve feet high moving on a turn-table, which remains visible as the visitor goes from point to point through the cave.

Other exhibits, photos not available, are as follows:—

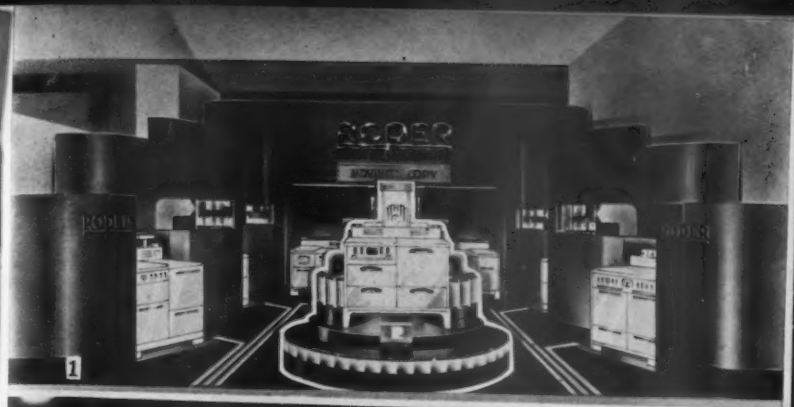
American Gas Products Co.; Water Heaters, conversion burners, central heating and air conditioning units, space heaters, etc.

Cleveland Heater Company; water heaters.

Cribben & Sexton Company; Ranges.

Roberts & Mander Stove Co.; Ranges.

Hardwick Stove Co.; Ranges.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2

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6

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TAPPAN
TAPPAN

3

ROBERTSHAW
YOUNGWOOD, PA

7

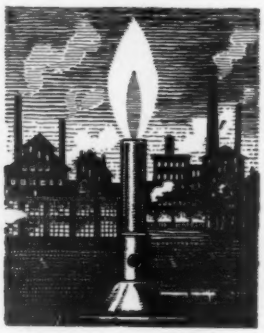
8

WELSBACH

9

Selling Industrial Gas

by
Raymond F. Mann
Wentz-Mann Company
Kenmore, N. Y.



SALESMANSHIP is a difficult subject about which to write, difficult both because it covers so much and because to such a great degree it is a question of personality, a most intangible thing to try to describe. We all know men that we call born salesmen, men that have no greater knowledge of the product, no greater intelligence or education, no greater perserverance than other men, yet with infinitely more ability to make sales. The difference distinguishing such men is an almost indefinable something we call "personality." All selling calls for this quality; but the degree to which it is essential for success varies with the nature of the product being sold, usually almost in inverse ratio to the engineering involved. Thus, its possession is a sine quo non for the door-to-door salesman of magazines, brushes, vacuum cleaners, and the like. Such salesmen receive a sample kit, a price list, and possibly a brief training consisting of "canned" sales talks and standard answers to the stereotyped questions and objections of the householder. Then, let loose upon the world, personality spells success; the lack of it, failure.

On the other hand, in the selling of industrial gas, while personality can not be disregarded, yet in most cases it is distinctly subordinate to technical knowledge concerning the matter in hand. The plant manager can not be convinced by conversation, but only by an array of facts and figures. High pressure methods fail; but the ability to talk the plant manager's language, to answer his questions on the engineering features involved lead to success. Since men are not born with such specialized knowledge but only acquire it through education and experience, industrial gas engineers are not born but made. It is true enough, however, that together with the technical knowledge there must be some degree of personality, some salesmanship, that gets the signature on the dotted line after an array of facts has brought conviction to the prospect. No article by this writer can develop that last touch of personality, and hence this article will be an effort only to point the way and show how to marshal the facts so as to lead the prospect up to that dotted line.

The subject of industrial gas sales covers such a wide range, stretching all the way from a 50 cent burner to a $100,000 furnace, that generalizations are difficult. For simplification, therefore, we will first divide the field into two main classifications that call for entirely different methods of attack. The first classification will be those sales where the purchase of new equipment is contemplated, and the industrial gas salesman has been called in or has volunteered his services. The second classification will be sales work done with the hope of substituting gas for a fuel now in use, probably in most cases satisfactorily so.

The Purchase of New Equipment

Four sub-divisions are possible under this main heading, corresponding roughly with stages in the development of the industrial gas engineer himself.

Sub-division 1 might be labelled as "catalogue selling." The prospect knows just what he wants and is familiar with equipment of that nature. Thus, a small steam boiler for a tailoring shop, a doughnut kettle or a cabinet bake oven for the neighborhood bakery, a soldering furnace or a general purpose furnace for a machine shop all fit this case. All that is necessary is to open a catalogue, show a cut of the article, and quote a price. Usually the catalogue gives gas demand and other pertinent engineering data. This is work that a cadet engineer can do and usually forms his apprenticeship in selling.

Sub-division 2 is the next upward step and can be defined as semi-engineering sales. This comprises those cases where the gas salesman is called upon to tell the prospect what he needs in the way of equipment but finds in the manufacturers' catalogues the burners and furnaces to do the job. Steam boilers for process work, melting furnaces in general, heat treating furnaces of all types fall in this category. The consumer wants to do a certain job and asks the salesman's advice on the best way to do it with gas. Calculations as to gas demand are necessary, and then follows the choice of the furnace that will best fit the particular problem. This involves engineering and is the second step in the education of the industrial gas engineer.

Sub-division 3 covers true engineering sales, where it is necessary not only to calculate in advance the heat demand but also to design equipment to meet the demand. The heating of core ovens, most drying problems, galvanizing kettles, work for the chemical industries and special jobs of all kinds are included in this sub-division. They form the best test of the industrial engineer's true worth. If he can handle all of them, he is entitled to consider himself a full-fledged engineer.

Sub-division 4, the last, embraces those specialized sales where the problem is turned over to the manufacturer of gas furnaces and the industrial man acts largely as a liaison officer between prospect and manufacturer. Radiant tube annealers, tunnel kilns, diathermatic travelling bread ovens, and similar equipment where many thousand dollars are in question are here represented. The manufacturer working on a national basis is in daily touch with such problems and is far better equipped than any gas company man to engineer and sell the necessary furnaces. However, the representative of the manufacturer must receive considerable aid from the local industrial engineer on such questions as rates, the running of mains and laterals, the costs of competitive fuels locally, and a number of other items. The two

work hand in hand and it often is a question as to which one makes the sale. Only by being thoroughly familiar with the problem involved and the working of the equipment designed to meet it can the gas company engineer contribute his full share to the partnership.

Running over these four classes into which the sales of new equipment can be divided, the requirements of the salesman are quite self-evident. The first is a thorough acquaintance with all the different burner systems on the market and all the standard furnaces and ovens available. This information is to be found in the catalogues of the various manufacturers; and every industrial man should have in his possession a complete library of such catalogues and be thoroughly familiar with their contents. Further he should welcome with open arms the representatives of these manufacturers. Not only do these men know the inside story of their own equipment and how to take every advantage of its particular features, but also in their travels from city to city they pick up much information on what industrial men are doing elsewhere and can help considerably to broaden the horizon of the local man. Naturally too, the industrial engineer must read carefully the trade journals and the publications of the American Gas Association, and keep abreast of new developments. Work on committees of the A.G.A., attendance at conventions, visits to other gas companies all help to round out his education and complete his knowledge of what has been and is being done with gas in the industrial field.

The next essential qualification is that of a sound engineering background, of seeing problems from an engineering standpoint and of attacking them in an engineering fashion. Without hazarding any opinion as to whether engineers are born or made, we do know that an engineer is one who searches for the facts carefully and develops in an orderly fashion to a logical conclusion the data obtained. He is a man who deals in facts and figures, not fancies or foibles. He specializes in the truth and attempts to fool neither himself nor others. He is accurate, careful and painstaking. He knows where to find and how to apply the formulas needed and he carries in his head rules of thumb and approximations with which to check his calculated results.

The last qualification is one that comes only with time and experience and a background of work accomplished upon which to draw for ideas. Experience also means having made mistakes and possessing the ability to avoid such mistakes a second time. There is, fortunately or unfortunately, little that can be substituted for experience; and until time has given it, the entered apprentice should proceed with caution when on unfamiliar ground and check and double check all his work, a trait of a good engineer at any time.

Selling Gas to Replace Another Fuel

Leaving now the selling of new equipment, let us turn to that field where the biggest opportunities usually lie and where we meet our greatest challenge, the conversion to gas of equipment now served by other fuels. Again we find it difficult to lay down rules to fit all cases; but in general sales in this field are most easily and lastingly made as the result of four distinct steps. In order, these four steps are: (1) Permission to make a detailed survey; (2) the carrying out of such a survey; (3) the embodying in a written report of the results of the survey plus an accurate estimate of the results should gas be substituted, and (4) a trial installation of gas on a guarantee basis. Taking these up in that order we have:

(1) Permission to make a Survey

Sales are sometimes made without a detailed survey. Once in a while management is so dissatisfied with the performance of the fuel on hand that it grasps at something that promises more. A trial installation is offered and accepted. Often the trial is satisfactory and the sale is made. Sometimes, however, after gas is in, the question arises as to whether it really is cheaper, whether it really is reducing costs or increasing production. Then unless a detailed survey has been made the going may be difficult. A survey with complete records on costs and production under the old fuel is your best protection in such cases.

In most plants, however, management is more or less satisfied with the fuel in use. Unsupported statements on your part that gas would be cheaper (the main reason for any plant spending money on changes) is met with polite skepticism at the best. You must be able to talk figures, to say that the present fuel costs so much per pound of finished product while with gas it would be but so much, a saving of such and such a year. The only way to get these figures in 99 plants out of a 100 is to run a survey. You can accept as an axiom the statement that management almost never knows its detailed fuel costs. There may be an oil meter on the line feeding that department, maybe on each individual furnace. Perhaps these meters may even be read occasionally, but figures showing how many pounds of cores, how many loaves of bread, how many forgings are produced per gallon of oil are lacking. The percentage of scrap or of seconds is rarely known. The exact labor cost involved is another unknown. As for the cost of oil *at the burner* or coal *on the grate*, only one plant in a hundred makes any attempt to set up accurate figures covering this important item. Management is concerned mainly with getting out production at a cost that means a profit, and spends little energy investigating apparent unavoidable items of cost. This is not, however, because of any lack of interest; and your offer to furnish them with such data at no expense or obligation on their part without any interference with production is generally more than welcomed.

In getting permission for a survey always start at the very top, with the highest executive of the plant. This is important for several reasons. In the first place, it is generally the man at the top that is most interested in reducing operating costs; and usually this same man is the one easiest to see and with the most time to listen to your story. In the second place, when he refers you to the proper official to contact you have the distinct advantage of an introduction from "the big boss." Your mission gains in prestige, and you are much more apt to get every possible bit of cooperation. Further if any holdup does occur along the line, if you don't get action on a favorable report, you can always go back to the man at the top. Men resent going over their heads to the boss, but if he is the man who sent you there in the first place there can be no resentment in reporting to him. Lastly, you save time. Permission for the survey and later for the expenditures you recommend must eventually come from above. You may be able to sell the plant engineer on your ideas but can he sell the superintendent and the superintendent in turn sell the plant manager? Parenthetically, the writer has always been granted an interview

sooner, been given more undivided attention, and received a more cordial reception the higher up the ladder he went. The qualities that lift a man to the top are those that make him most receptive to new ideas and the quickest to grasp the potential advantages of your plan.

(2) Making the Survey

The information that is desired naturally governs how the survey is carried out. So before starting out we should outline the facts we are after, drawing up log sheets for the man or men that will do the actual work of the survey. We shall want full data on production, the weight of each charge, the weight of the racks or containers, the loss of weight in heating up, fuel consumption, time, percentage of spoiled ware, and the labor involved; also any other items of cost such as metal loss and pot life in melting practise, dross formation and kettle life in galvanizing, burned and green cores in core baking, etc. Space on the log sheets should be allowed for noting any out-of-the-ordinary occurrences, forced shutdowns, breakdowns, and the like. Furthermore an attempt should be made to ascertain fuel costs *at the furnace* as distinguished from invoice costs. Previous articles (see *American Gas Journal* for March, April, and May 1939) have described many of these additional costs. Resort to plant ledgers, inspection of the equipment used, and comparison with costs obtained in other plants help on this point.

The actual mechanics of running the tests and their duration depend on good engineering judgment. Naturally the time of testing must be long enough to get average results. If production is constant from day to day, one day's run may be enough. If schedules vary widely, on the other hand, enough runs must be made to get conditions at their worst and at their best. The report means nothing if criticism can be raised that the figures are not representative. The report must give a true picture of everyday conditions.

The question of measurement arises. With coal, arrangements should be made if possible to run each wheelbarrow over a scale, or several buggies are weighed and an average weight per buggy established, or a certain known tonnage is set aside and drawn upon over the test period. With oil, metering is possible. It has been our experience that oil meters are not too accurate at low flows, and quite often stick. Flows of 10 gallons an hour or better usually give accurate registrations, although as a double check we have put two meters in series. Flows of only two or three gallons per hour call for different methods. Our practise has been to use a calibrated drum feeding through a small oil pump directly to the burners. An ordinary 42 gallon oil drum with a gage glass on the side, calibrated and graduated, gives accurate measurement; or the difference in weight before and after the test can be converted into gallons, knowing the specific gravity of the oil. A small oil pump suitable for the purpose can be bought at any automobile parts store and a ¼ horsepower electric motor may be mounted so as to drive it. Adjustment of the bypass enables the oil pressure to be set at a figure that will duplicate ordinary operation. Such an outfit is readily portable and can be hooked in place quickly and easily by your own men or by the test engineer.

Probably the most valuable asset of all in a plant survey is a good man running it. If the man you leave on the job for the period of the test makes friends with the plant operatives, keeps his ears and eyes open, and possesses a good native intelligence, he can give tremendous help in the writing of the report and in guiding the later sales effort. He will often discover any weak spots in the armor, and furnish you with the point of attack. So select this man carefully, and you will be well repaid.

(3) The Report

The results of the tests should be embodied in a clear and concise engineering report, one that shows plainly operation and costs with the present fuel and estimates with reasonable accuracy operation and costs as they would be with gas. A typical table of contents would be as follows:

A. Summary.

B. Introduction.
Unit cost of fuels.

C. Observed Data.
1. **Nature of work.**
2. **Present equipment.**
3. **Hours of present operation.**
4. **Summary of Test Data.**
5. **Accessory Data.**
6. **Present Costs.**

D. Recommendations.
1. **Burner equipment.**
2. **Estimated Production and Fuel Data.**
3. **Costs with Gas Firing.**
4. **Comparison of costs.**

E. Appendix.
1. **Log of Tests.**

Considering the above items in the order shown a brief description of the material included might be the following:—

A. Summary. At the very start there is given a brief summary of the work attempted, the results found, and the savings and advantages that would accrue from a change to gas in line with the recommendations embodied in the report. This summary should serve to focus the attention of the management upon the report and demonstrate the value of the survey.

B. Introduction. Before getting

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into costs of operation it is desirable to determine the unit cost of the fuel in question and of gas. Thus at this point it is well to set down the invoice cost of the oil or coke and add to it the so-called "handling cost" of the fuel. This latter figure is partly determined and partly estimated and this is the logical place to give the figure and your reasons for its magnitude. The gas rate is also given at this point and where there is a sliding scale an estimate of the exact rate that will be earned.

C. Observed Data. The titles of the various subdivisions under this main heading are more or less self-explanatory. After a brief description of the nature of the work (core baking, galvanizing, heat treating, japanning, etc.), the equipment used (number and size of furnaces or ovens and how heated), and the hours of operation, a table summarizing the test data is given. Several such tables have been used in previous articles just as they appeared in reports. Here in concise, indisputable fashion are the facts covering operation with the present fuel. This is followed by accessory data, additional information not readily presentable in tabular form. The final sub-division "Present Costs" gives the operating costs on a weekly, monthly, and yearly basis, using the data of the tests and the fuel cost of the introduction.

D. Recommendations. Logically the next step is to present the recommendations you believe will lower the costs just discovered and improve the conditions at present faulty. There is first a description of the gas burner equipment and how it would be installed. Also the cost of the changes recommended. This is followed by an estimate of the production and gas consumption after these changes. In this connection always estimate on the safe side. Use a gas figure that is conservative. Last are given the weekly, monthly, and yearly costs if gas is adopted and a comparison of these costs with those on the present fuel.

E. Appendix. The final section of the report gives the actual logs of the various test runs. This supports the tabulated data and is the best proof of the accuracy of the same.

(4) The Trial Installation

When the report has been completed it is presented to the plant management, once again as high up as possible for the same reasons already given. Usually this means a short interview with just time to point out one or two salient features. The report is then left for study and a date made to discuss it in detail. At the second interview after the plant manager is forced to agree that your costs of present operation are correct, you turn naturally to the saving and improvement in converting to gas and ask for the order to make the change. If the report shows a saving adequate to amortize the investment in new equipment within a reasonable time (2 to 5 years usually), the only grounds for refusing to go ahead is doubt of your estimated gas costs. "Yes," says the plant manager, "your figures as to what it is costing us now are undoubtedly correct but what assurance do we have that the costs with gas will be as low as you estimate?" Then your ace in the hole is an offer to install gas on trial just as recommended in the report with the understanding that they will buy the equipment if a test shows that the gas costs equal or better the estimate. This display of confidence in the gas figures on your part usually clinches matters and permission to make the trial installation follows. Then, if your engineering has been sound and your estimate conservative, you need have no fears, the sale has been made.

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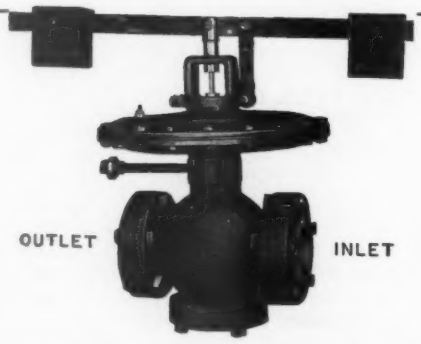

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Coal Gas Manufacture

New Process Utilizing Latest Scientific Knowledge

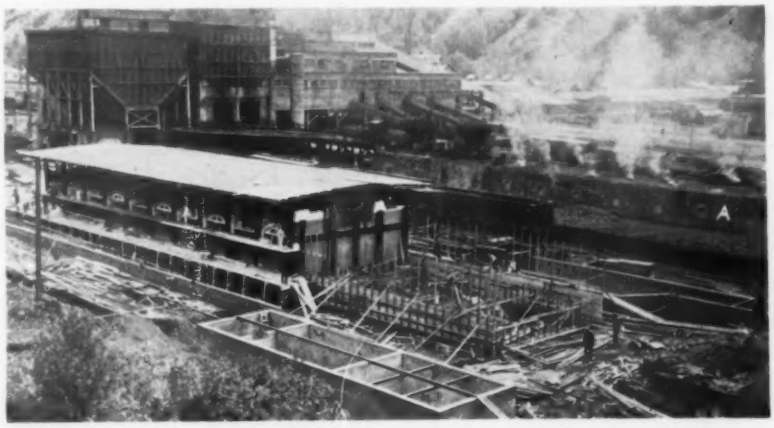
By
M. D. Curran
President Coal Carbonizing Company and Radiant Fuel Corporation
St. Louis, Missouri

THE manufacture of coal gas has generally been accomplished through the use of either horizontal or vertical retorts or by-product coke ovens. The former have been utilized in small and medium sized communities whereas large by-product coking establishments have been restricted to large centers of population where a market for substantial amounts of metallurgical coke existed and where the large scale investment would be justified. While it is true that these large by-product coking units have disposed of large quantities of their coke for domestic use or for water gas manufacture, the residual credit has to some extent been favorably affected by higher prices received for substantial tonnages of metallurgical coke. Since carbonization units of this type have been restricted to the large centers of population, it is conversely true that the great majority of coal gas installations have been of the retort type.

In the northern part of the United States where markets exist for large quantities of house heating fuel, it may be said that coal gas manufacturing methods provided the lowest holder cost for manufactured gas. Nevertheless, we find today that many retort plants have been abandoned in favor of the carburetted water gas. In some cases the shift to water gas has not been made at the request of the operating companies, but rather was brought about by parent companies where temporary relief could be offered with the minimum expenditure of capital. In other cases the problems involved in disposal of coke were so extensive as to force the abandonment of coke production. Changing factors which affect gas manufacturing costs at various locations have sometimes governed manufacturing methods. My object in appearing before this group today is to call your attention to some changes which are taking place in our industrial economy which may prove beneficial to the gas industry.

The coal mining industry of our nation is undergoing certain changes at the present time which are worthy of your consideration. Development of a public demand for automatic heat, which was originally created largely through the efforts of the gas industry, has not only increased the use of gas heating, but has also been the means of stimulating the use of automatic devices which utilize both oil and coal to provide automatic heat. The mining industry is actively engaged in producing increasing amounts of stoker sized coal for both domestic and industrial use. Household stokers unquestionably increase the useful heat value obtained from coal and the combination of decreased heating costs and automatic heat provided by this machine will undoubtedly create a much greater demand for stoker sized coal. The mine operator has found it desirable to remove the small sized screenings from the stoker coal and therefore in meeting the demand for this particular size, he must produce substantial amounts of screenings under ¼" in size which we believe may be utilized by the gas industry for the manufacture of coal gas with a saving in gas manufacturing costs.

At this point, I should like to call your attention to coke quality and some of our present-day information on this subject. The disposal of coke up to the present time has in many cases been a source of serious difficulty. In the case of retort coke the combustion characteristic has often been such that the coke burned too rapidly and the fire was difficult to maintain. In the case of by-product coke resulting from the manufacture of metallurgical grades, users have had difficulty on account of certain slow burning characteristics. It is pretty generally believed that the coke quality obtained in carbonization depends largely upon the character of coal from which it is made and upon the conditions under which it is carbonized. Accepting this theory as a starting point, it is important to consider the conditions surrounding carbonization which have a profound effect upon the character of the coke substance as well as the by-products of distillation. Until recently little was known with any certainty about the structure of coke. It was regarded as carbon containing some hydrogen and other elements but it was never understood as to whether it was a complex hydro-carbon, being rich in carbon or whether it consisted mainly of elementary carbon containing small quantities of complex hydro-carbons. The extension of real knowledge within recent years makes us now believe it to be essentially elementary carbon.



In the foreground is installation of Curran-Knowles ovens under construction at Michel, B. C., to carbonize expanding coal. Note at A. the beehive ovens now in use.

Presented at the Joint Committee Conference of the Production and Chemical Committees, A.G.A., Rochester, N. Y., May 24, 1939.

It is now recognized that coal must be considered as a complex organic compound which decomposes progressively under the action of heat. One outstanding investigator has likened the structure of coal to a pile of fragments of wire netting containing four or five hexagonal rings with chemical linkages at the junction points of three wires where carbon atoms may be joined to oxygen, nitrogen or sulphur. The application of heat to such a structure necessarily increases the molecular and atomic vibrations and carbonization is considered to produce the same effect as would be obtained by shaking this pile of fragments so that those which were less firmly attached would be the first to be loosened and detached and with the increase in activity developed by application of higher temperatures, even the more firmly attached ones would be loosened. Such a conception of the structure of coal is helpful in understanding the crystallographic picture of carbonization as recently developed through x-ray investigation. As a matter of fact, our normal conception of the plastic stage and the well established knowledge of pressure effects must be retained and given full consideration in connection with crystallographic analysis.

In the initial stages of carbonization highly condensed aromatic nuclei are believed to be formed as polycyclic structures which arrange themselves in a graphite-like crystallographic lattice. As the temperature rises graphite nuclei are formed surrounded by chemically bound complex hydro-carbon rings and chains which are chemically bound through the graphite crystals. The structure of low temperature coke is therefore a mass of carbon crystallites having hydro-carbon radicals attached to the border carbon atoms. When the temperature reaches about 700° C to 750° C the coke changes in character and it is evident that this is a critical temperature. As a matter of fact, there is no doubt but that there is a change in the molecular structure of the coke substance which is of very great importance. It has been shown that a rapid increase in electrical conductivity occurs at about this temperature which suggests that the structure of the coke has been modified by the liberation of metallic electrons. Also it has been determined that the adsorptive power of carbon formed by carbonization increases up to 700° C and thereafter decreases. It has also been shown that at temperatures above 750° C the ignition temperature increases and the combustibility of coke diminishes. In other words, it is a well established fact that when the coke substance is subjected to temperatures ranging from 1200° C to 1300° C the molecular arrangement has been so changed as to materially affect its reactivity.

So much work has been done through X-ray and other examinations in recent years that no one skilled in the art would express doubt as to the marked effect which the carbonizing temperature has upon the molecular arrangement of carbon in the coke substance. Neither is there any question as to the change in combustion characteristics of the coke substance accompanying changes in the molecular arrangement of the carbon. Extended researches looking into the effect of pressure during carbonization have likewise disclosed that the texture of the coke substance is materially affected by the pressure exerted on the plastic layer. These recent researches have thrown important light upon the mechanism of coke formation, particularly above the plastic range so that we are now better able to understand the fundamental process of carbonization.

Description of Process

The Curran-Knowles Process utilizes the Sole Flue Type Coking Oven, where the coal charge is spread in a relatively thin layer on a horizontal hearth which is heated from beneath. The layer of coal is usually 10″ to 12″ thick and from 8′ to 10′ wide and 30′ to 40′ long depending upon the size of the oven chamber for a particular installation. We have attempted to utilize the knowledge now available on the fundamental processes of carbonization to develop a practical method of distillation wherein conditions have been established which permit the production of a coke substance with improved combustion characteristics.

The reactions taking place under conditions so established differ widely from those which occur when coal is treated at the same wall temperature in the vertical slot-type coking chamber. The action of the hot gases passing upward through the coal charge and the low pressure to which the coal is subjected in the liquid or plastic stage creates carbonizing conditions which are very much different than those prevailing in other known methods of carbonization. In addition to the fact that a different molecular arrangement of the carbon is developed, the carbonizing reaction is accompanied by less than the usual amount of cracking of the products of distillation with the result that higher yields of high temperature tar are obtained.

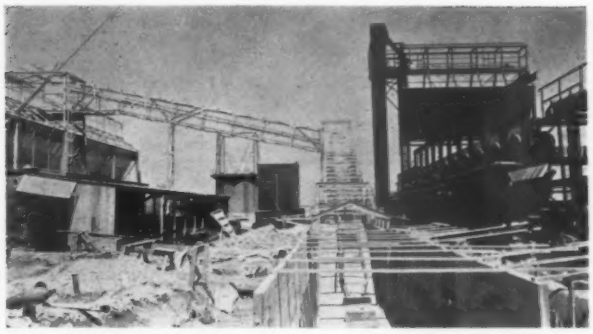
The primary objectives in the development of this process were the manufacture of a more highly reactive coke than has been heretofore possible with the usual type of coking equipment, and at the same time, a means for utilizing feebly coking coals, and the production of a physically strong coke without resorting to blending of coals.

The physical texture of the coke substance produced in this process is such that it is more highly reactive with air and accordingly has ignition and combustion qualities better suited to the requirements of the household furnace. It is easily kindled and will sustain combustion at very low temperatures. These qualities permit the domestic user to develop full heat much quicker and to maintain his fire with ease during the mild weather heating periods in the spring and fall months.

The tar produced from various high volatile as well as low volatile coals has all been of the same general character and is known to contain large amounts of the valuable tar acids and substantially less pitch than is contained in the type of tar with which we are all familiar. The yield of tar from any given coal is usually in the neighborhood of 50% greater than is obtained when it is carbonized by other methods. The tar is very low in free carbon and other constituents which produce emulsification so that generally it separates itself from water without the use of any dehydrating equipment.

The plant operating in Southern Illinois is carbonizing 5/16″ x 0″ dust from the No. 6 seam Illinois coal. This particular coal runs very high in oxygen and contains more than the average amount of fusain substance so that the fines being utilized at this plant would normally be classified as feebly coking. The application of heat to the underside of the coal charge with corresponding flow of gases upward through the coal develops a cementing action which is not otherwise possible, with the result that a strong coke substance is produced. This plant has been operating on this coal since December, 1933, and supplies the gas requirements of a utility system which serves fourteen communities in adjoining counties.

The plant operating at Owen Sound, Ontario, demonstrates the applicability of this process to the gas industry where experience shows that small sized screenings from gas coals can be carbonized to produce a high quality domestic coke and a uniform quality of gas. The use of



Plant near Millstadt, Ill., in course of construction.

The Midwest Smokeless Fuel Co. Plant near Millstadt, Ill., now nearing completion.

such small sized screenings permits a substantial saving in the cost of coal, while at the same time the improved quality of the coke substance creates a greater public demand and increased revenue from coke sales. The combination of these two sources of economy materially reduces the cost of gas. Further savings are effected due to the production of a large quantity of high grade tar, the revenue from which is sufficient to cover a large part of the expense of operating the plant. The operation of this plant is carried on with two men per shift and an extra man on days to handle the maintenance and coal preparation plant. Coal is introduced in five-ton charges at intervals about four hours apart. The heating value of the gas is unusually constant and this is accounted for by the fact that this process yields a gas which is fairly constant in heating value throughout the entire carbonizing period. The carbonized product is pushed from the oven into a metallic conveyor which delivers it through a quencher and to a wharf from whence it is carried by a belt conveyor to a screening station where it is crushed and screened into five sizes. The braize or smaller size is mixed with the incoming coal and this is accomplished without impairing the quality of the coke substance.

Two plants are now under construction. One is being built in the East St. Louis District for the Midwest Smokeless Fuel Corporation where the principal product is smokeless fuel which will be made from the local coal and sold in the St. Louis market. The other is being built to operate in connection with mining operations in British Columbia, Canada, where small sized screenings of low volatile expanding coal will be converted into a very high grade carbonized product for the northern markets. The gas produced in both of these plants will be used for industrial fuel as it so happens there is not at this time immediate use for it in connection with gas utility service.

Medium sized installations of our equipment can be utilized to give very reasonable gas costs by underfiring the ovens with producer gas made from a part of the coke residue. It is thus possible to adjust the plant operation so that it can comply with the existing solid fuel requirements, or take care of a reasonably wide fluctuation in the demand for gas between the summer and winter months.

We believe that our approach to coal carbonization provides the gas industry with a basis of coal gas manufacture which opens the door to new opportunities. Coal gas manufacturing methods have held a strong position in the gas industry in the past even though the coke produced had qualities which made it hard to sell at a satisfactory price. Our experience of several years has shown that the coke substance produced in our process occupies a preferred position with the consuming public, which is entirely due to its improved burning characteristics. I have indicated to you briefly that our technical understanding of the carbonizing reaction enables us to account for the improved b u r n i n g characteristics which we develop.

Since the residue of the coal gas operation constitutes the most valuable product of the operation, it is essential that it be readily saleable. We consider that the success of coal gas manufacturing methods is more dependent upon the marketability of the coke residue than on any other single factor and so we feel that when the gas industry is put on a basis where it can supply a desirable solid fuel in connection with its gas making operations, there will necessarily be a change reflected in the residual credit which will reduce holder costs.

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Right of Court to Invalidate Gas Rates

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

IT is fundamental law that the judicial power to declare legislative gas rates invalid is to be exercised only in clear cases. The constitutional invalidity must be manifest, and if it rests upon disputed questions of fact the invalidating facts must be proved.

It is important to know that various higher courts have held that any state statute or city ordinance is void which prohibits gas corporations from establishing rates adequate to net a reasonable return on the investment.

For illustration, in Avant Gas Service Co. v. Corporation Commission et al., 89 P. (2d) 291, reported May 5, 1939, it was shown that several years ago a state law in Oklahoma was passed prohibiting gas companies from making a fixed minimum charge, and providing further that the consumers should be charged only for the gas used or consumed as registered by the gas meter. The law also stipulated a flat meter rate without a service charge.

The gas company is now, and has been for a number of years, losing money in furnishing gas to the inhabitants of a municipality solely by reason of this state law.

The company on account of these conditions sought permission to establish a flat meter rate per M. cubic feet within the ability of the people to pay, together with authority to charge each consumer a designated monthly service charge or minimum bill. It asserted that such a service charge or minimum bill against each meter would serve to equalize the cost of service among consumers and make possible a reasonably low rate per M. cubic feet, and also that such a rate structure would give to the company a fair return, and to the consumer a cost of service reasonably fair and equitable under the circumstances.

The Public Service Commission decided that the greater number of bills rendered for gas service in the municipality fell far short of the actual cost of the service rendered, thus casting upon the smaller percentage of patrons (those who purchase larger quantities of gas) the burden of paying not only for their own service but also of contributing to the deficit created by the small consumers. In other words, a small percentage of the consumers were paying a large percentage of the cost of service common to all.

The Commission held that an increase in flat rate sufficient to bring a fair return would be unduly burdensome upon that class of consumers who use substantial quantities of gas. The request of the gas company was denied solely on the ground that a law in the above mentioned state prohibits gas utilities from making and maintaining a fixed minimum charge for gas, or for the use of gas meter, or for the inspection of any gas meter used on the premises of any consumer, and further provides that the consumer shall be charged only for the gas used or consumed as registered by the gas meter.

Therefore, the gas company appealed to the court to hold the state law unconstitutional and void. It is interesting to know that the higher court held the law invalid, and said:

"The evidence, without room for doubt, shows that the gas company cannot continue in business and serve the citizens at a flat meter rate alone and avoid ultimate loss of its property. It is entitled to operate its business and to realize a reasonable profit therefrom. Any statute that would deprive it of either of those rights stands squarely in opposition to that portion of the 14th Amendment to the Federal Constitution, U.S.C.A., which declares that the State shall deprive no person of his property without due process of law. Though the company's business is stamped with a public interest, it is entitled to operate the same and to receive from such operation a fair return in profit to be calculated under certain established rules and principles applicable in such cases. If the State in its attempt to regulate rates and service goes beyond that point of restriction, it must be concluded that it has exceeded the limitations placed upon it by the Federal Constitution in that such action would result in an appropriation of the company's property without compensation thus to abridge the privileges and immunities to which it is entitled as a citizen of the United States, and to take its property without due process of law."

It is important to know that monthly service charges and minimum monthly bills have been recognized in a number of states as necessary elements in fixing equitable rates on the theory that the cost of service without such a charge is unequally distributed among consumers. See City of Rochester v. Rochester Gas & Electric Corp., 233 N.Y. 39; Rivelli v. Providence Gas Co., 44 R.I. 76.

Into every state statute of this kind the courts read an implied condition. The condition is that the rates shall remain in force at such times and at such times *only* as their enforcement will *not* work denial to the gas company of the right to a fair return. When the return falls below that level, the law will be suspended.

On the other hand, many higher courts have held that where rates are susceptible of proper adjustment without a monthly service charge or minimum bill a state statute prohibiting such charge must be observed by the rate fixing officers. The modern view is that statutes of this character are not necessarily void in their inception, but are, in their application, subject to changing times and conditions, and to different localities and their respective demands.

For example, in New York & Queens Gas Co. v. Prendergast, 1 Fed. (2d) 351, the Federal court had under consideration a statute of New York fixing a maximum flat rate per thousand cubic feet for gas, prohibiting a service charge. Concerning the question of fixing rates under those statutes, the court announced the rule as follows:

"It is within the power of a Legislature to prescribe the form of charges by a gas company, and a statute prohibiting a 'service charge' is in itself constitutional and valid; but when, taken in connection with another statute or order of a Public Service Commission fixing a maximum price for gas, it so reduces the entire permissible charge that it becomes confiscatory, it is unconstitutional."

And in United States Light & Heat Corp. v. Niagara Falls Gas & Electric Light Co., 23 F. (2d) 719, the court in language highly appropriate to the situation summed up the legal effect of statutes of this nature when the same interference with the gas utility's right to a reasonable return. The language of this court is as follows:

"Here, as already stated, the evidence in its entirety warrants holding that in prohibiting the so-called service charge to consumers of gas at Niagara Falls, the gas company is estopped from allocating the cost of production to the consumers in equal proportions, and, moreover, is prevented from earning a reasonable profit upon its invested capital. The enforcement of the particular statute in controversy must therefore be held to be confiscatory and in violation of the constitutional rights of both plaintiffs and of the Niagara Falls Gas & Electric Light Company."

Going Concern Value

Obviously, an important consideration is "going concern value" when determining whether a gas rate state law or city ordinance is void.

The earlier higher court cases on going concern value seem to indicate clearly that going concern value as such should be definitely reflected in the rate base, but recent decisions have modified this rule. Of course, if the rate base makes an allowance for capital sufficiently great to include an amount sufficient to cover going concern value, it is quite immaterial that going concern value is not allowed. But the latest decision of the Supreme Court of the United States on going concern value, Denver Co. v. U. S., 304 U.S. 470, holds definitely that going concern value need not be accorded a specific value in the rate base; but more important still that decision holds that if the record shows that the property of the gas corporation dedicated to the public use is valued as a going concern, this is sufficient recognition of going concern value. The decision is so important and so recent that we quote therefrom at length:

"While it may be considered as made up of tangible and intangible elements, it is not necessarily to be appraised by adding to cost figures attributable to mere physical plant something to cover the value of the business. Value depends upon use and is measured, or at least significantly indicated, by the profitableness of present and prospective service rendered at rates that are just and reasonable as between the owner of and those served by the property. . . . It is elementary that value of a going concern may be less than, equal to, or more than, present cost of plant less depreciation plus necessary supplies and working capital."

Obsolete Property

The next question to consider is the investment in retired gas plants. The basic question is whether or not these plants are usable. If the manufacturing plants are rendered useless by reason of the introduction of natural gas, these items should no longer be included in the capital structure of the company.

For example, in the late case of Pacific Gas & Electric Co. v. Commission of California et al., 26 F. Supp. 507, reported April 17, 1939, the litigation involved several points of law, among which was the fact that the Public Service Commission allowed $150,000 per annum for the amortization of the manufacturing gas plants no longer used or useful.

The gas company claimed it should have been allowed $238,092 per annum for this purpose, which was allowed by the Special Master. Upon this question the Federal Court held:

"Upon the question of confiscation we are concerned only with a reasonable return upon property used or useful. Consequently, no allowance should be incorporated in the fair value of the Company's property to cover these items nor should any amount for amortization be included in the deductions from gross revenue. The sum of $150,000 is not deductible as an operating expense."

Accrued and Annual Depreciation

One of the principal difficulties in fixing just compensation for the use of the property of a gas company arises from the fact that such property continuously depreciates. To make a proper annual allowance for such depreciation and to ascertain its present value by a deduction of the annual depreciation are the two phases of the problem.

It is settled law that in determining the fair value of the property, for rate making purposes, it is essential that accrued depreciation be deducted from the cost to "reproduce new" in using that evidence for the determination of the present value of the property. Similarly, in using the evidence of historical cost to determine present value there must be an appropriate deduction for accrued depreciation. The rate base should lie somewhere between the historical cost depreciated and the reproduction cost new depreciated.

The Supreme Court has held repeatedly that the question of confiscation is not a question of formulas, modes or methods used in arriving at the rate, but whether or not, under all the circumstances, just compensation for the use of the property of a public utility at its present value has been denied. Under the constitution, the objective of the rate maker should be to ascertain the actual depreciation for the year, or years in which the rates will be effective, and to allow such depreciation as deduction from gross income; and, also, in measuring the return upon capital, to ascertain the value of the property as depreciated at the time of its use. In other words, the "just compensation" safeguarded to gas companies by the Fourteenth Amendment is a reasonable return on the value of the property used at the time that it is being used for the public service; and rates not sufficient to yield that return are confiscatory.

The Supreme Court has recently in a number of cases recognized the use of a sinking fund to take care of the annual and accrued depreciation. See 291 U.S. 227; 292 U.S. 290.

By this method the gas company may invest its depreciation reserve as it sees fit, thus having the use of it long before the property requires replacement. However, it should be charged a reasonable rate of interest thereon so that the sum of the annuities plus the interest should equal, as near as may be, the average value of the property during its life expectancy. The higher courts hold that there is no confiscation of property inherent in such a plan, and that the question of whether or not the allowance of depreciation thus made is reasonable is one important point to be determined by the rate making body.

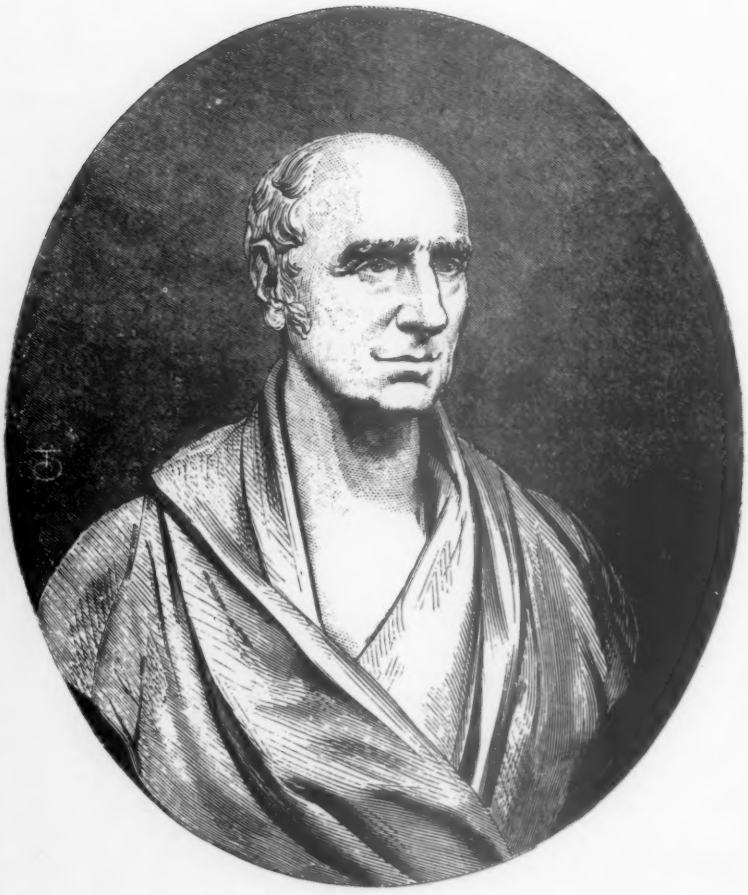
Valid Allowances Illustrated

While it is impractical to review the complete records of the Federal

(Concluded on page 50)

Comparison of Commission and Court Findings

	Commission	*Court*
Production expense	$ 3,874,445.34	$ 3,780,000.00
Transmission expense	270,012.44	293,000.00
Distribution expense	2,296,861.34	2,360,000.00
Commercial	1,006,974.47	1,010,000.00
New Business	769,843.07	812,000.00
General and Administrative, Injuries and Damages	702,000.00	650,862.34
Uncollectible Accounts	162,279.62	138,000.00
Taxes	2,362,029.88	2,362,029.88
Depreciation	1,769,110.00	2,964,057.50
Extra Depreciation on Retired Gas Plants	150,000.00	.....
Total	$13,363,565.16	$14,369,949.72



From an etching in a life of "James Watt"

William Murdoch

(1754-1839)

by John McLaverty

Supt., Sales Promotion Dept.,
The Consumers Gas Company of Toronto

NEAR the ancient city of Stirling in Scotland is a memorial known as the Wallace Monument erected to the memory of a Scottish hero. Within this monument is a circular room which has twelve panels dedicated to the memory of Scots who have gained the reputation of doing something of extreme value for Scotland or the world.

One of these panels perpetuates the name of William Murdoch, the man who made the first practical use of gas as an illuminant.

Murdoch was born in 1754, at Bellow's Mill, near Auchinleck, Ayrshire, Scotland, a district which has produced men famed in letters, science, exploration and the church.

James Watt, the man who did much to accelerate the early discoveries of the use of steam, was once much discouraged by the scarcity of good mechanics. He told Sir Walter Scott that probably hundreds of his northern countrymen had sought employment at his establishment, but he never could get one of them to become a first-rate mechanic. "Many of them," he related, "were too good for that and rose to be valuable clerks or bookkeepers; but those incapable of this sort of advancement had always the same insuperable aversion to toiling so long at any one point of mechanism as to gain the highest wages among the workmen."

Scottish mechanics, such as have made the Clyde workshops, were yet only in the course of training.

But William Murdoch made a great impression on his first interview with Boulton, who was a partner of the famous Watt. That was the interview where Boulton was captivated by the "timmer" (timber) hat which Murdoch had turned out on a lathe.

He was at once engaged as a mechanic and was immediately sent to Cornwall, where the engines supplied had been giving trouble. There he devoted himself to his duties with zeal and ability. Many recalcitrant engines were brought to order.

He was so filled with his work that, when he had an important job in hand, he could scarcely sleep at nights for thinking of it. When the engine at Wheal Union was ready for starting, the people of the house at Redruth, in which Murdoch lodged, were greatly disturbed one night by a strange noise in his room. Several heavy blows on the floor made them start from their beds, thinking the house was coming down. They rushed to Murdoch's room, and there was he in his shirt, heaving away at the bed-post in his sleep, calling out, "Now she goes, lads! Now she goes!"

In Cornwall, Murdoch was noted no less for his ability to tame balky engines than for his firm way with his help. He was a man of magnificent physique and was willing to, and did, use his fists to have the work entrusted to him proceed in a smooth and orderly way.

Murdoch spent night and day among the machinery in the Cornish mines, but he was not too busy to do some inventing on his own account. Watt had been exercised about a method to secure circular motion without using the crank. He devised no fewer than five distinct methods by which this object might be accomplished, by means of wheels of various sorts rotating around an axis.

The method eventually preferred was one invented by Murdoch. "It has the singular property," said Watt, "of going twice around for each stroke of the engine, and may be made to go around oftener without additional machinery."

This discovery of Murdoch's was then described as the "Sun and Planet Motion." Boulton, in a letter to a friend, admits that this was "first invented by William Murdoch."

Describing the troubles of Boulton and Watt in Cornwall, letters between the partners refer frequently to the sterling work of Murdoch. "Murdoch hath been indefatigable," said Boulton to Watt.

On one occasion, when an engine superintended by Murdoch stopped through some accident, the water rose in a mine and the miners were

Prepared by request for Canadian Gas Assn. to mark the Centenary of the death of William Murdoch.

driven out by the water. The miners yelled for Murdoch and threatened to tear him apart for having thrown them out of work. He made his way through the mob, got to work on the engine and soon had it pumping again. That was the time when the Cornish miners, famous for their temperamental ways, insisted on carrying Murdoch to his home on their shoulders.

Watt had been considering the idea of using steam as a locomotive power. In the course of time, Murdoch heard of it and employed his spare hours in constructing an actual working model. When the model was finished, he proceeded to try it in a long avenue leading to the parsonage of Redruth and, in so doing, nearly frightened the village pastor out of his wits.

When Watt heard of the experiment, he wrote to Boulton advising that Murdoch should be "gently counselled" to give up his scheme, lest it should interfere with his usefulness to the firm. Boulton dissuaded Murdoch from following his spare-time hobby, and nothing more was heard of Murdoch's experiment on steam locomotion.

It is to be regretted that he did not pursue his bent. But he was a modest, unambitious man, content to keep in the background, and not possessed of what is now commonly known as "push."

Murdoch is entitled to the credit of first putting gas to practical use. The inflammable qualities of the air obtained by distillation of coal had long been known, but Murdoch was the first to apply the knowledge to practical uses. The subject engaged much of his attention in the year 1792, when he resided at Redruth. As his days were fully occupied in attending to his employers' engine business, it was only in the evenings, after the day's work was over, that he could pursue the subject. It is not improbable that he was led to undertake the investigation by the enthusiasm of Mr. Boulton, of Boulton and Watt, which communicated itself to all with whom he came in contact.

It will be remembered that the latter occupied much of his leisure at Cosgarne in analysing earths, minerals and vegetable substances, trying to find out the gases they contained; Murdoch was his zealous assistant on these occasions. In the paper on the subject of lighting by coal-gas, which he communicated to the Royal Society in 1808, and and for which they awarded him their large Rumford Gold Medal, he observed, "It is now nearly sixteen years since (1792), in the course of experiments I was making at Redruth, in Cornwall, upon the quantities and qualities of the gas produced by distillation from different mineral and vegetable substances, that I was induced by some observations I had previously made upon the burning of coal, to try the combustion property of the gases produced from it, as well as from peat, wood and other inflammable substances; and being struck with the great quantities of gas which they afforded, as well as the brilliancy of the light, and the facility of its production, I instituted several experiments with a view of ascertaining the cost at which it might be obtained, compared with that of equal quantities of light yielded by oil and tallow. My apparatus consisted of an iron retort, with tinned iron and copper tubes, through which the gas was conducted to a considerable distance and there, as well as at intermediate points, was burnt through apertures of various forms and dimensions. The experiments were made upon coal of different qualities, which I procured from different parts of the kingdom, for the purpose of ascertaining which would give the most economical results. The gas was also washed with water and other means were employed to purify it."

Murdoch put his discovery to the best practical test by lighting up his house and offices at Redruth with gas. He also had a gas lantern constructed, with the jet attached to the bottom of the lantern and a bladder of gas underneath, with which he lighted himself home at night across the moors when returning from his work to his house at Redruth.

Many years later (in 1818), when Murdoch was at Manchester for the purpose of starting one of Boulton and Watt's engines, he was invited, with Mr. William Fairbairn, to dine at Medlock Bank, then at some distance from the lighted part of the town. "It was a dark winter's night," wrote Mr. Fairbairn, "and how to reach the house over such bad roads was a question not easily solved. Mr. Murdoch however, fruitful in resources, went to the Gas Works (then established in Manchester), where he filled a bladder which he had with him and, placing it under his arm like a bagpipe, he discharged through the stem of an old tobacco pipe a stream of gas which enabled us to walk in safety to Medlock Bank."

On the occasion of a visit which he made to Soho in 1794, he took the opportunity of mentioning to Mr. Watt the experiments he had made and their results, expressing his conviction of the superior economy, safety and illuminating qualities of coal gas, compared with oils and tallow. He then suggested that a patent should be taken out for the application, and at various subsequent periods he urged the subject upon the attention of his principals. But they were at the time so harassed by litigation in connection with a steam engine patent that they were unwilling to enter upon any new enterprise which might possibly lead them into fresh embroilments; so nothing was done to protect the invention.

On Murdoch's return to Soho in 1798, he proceeded with his investigations and contrived an apparatus for making, purifying and storing gas on a large scale, and several of the offices in the building were regularly lighted by its means. On the general illumination which took place in celebration of the Peace of Amiens in 1802, the front of the Soho Manufactory, his firm in London, was brilliantly illuminated with gas, to the astonishment and admiration of the public.

The flexibility, the safety, the economy and the brilliancy of the new light being thus proved, Boulton and Watt in 1803 authorized Murdoch to proceed with the general fitting-up of the manufactory with pipes and burners, and from that date it continued to be regularly lit with coal-gas. Several large firms followed their example, amongst others Phillips and Lee, Burley and Kennedy, at Manchester, and Gott and Sons, at Leeds; and the manufacture of gas-making apparatus became one of the regular branches of business at Soho. Several years later, in 1805, when Watt went down to Glasgow, he found gas in general use.

"The new lights," he wrote to Boulton, "are much in vogue here; many have attempted them and some have succeeded tolerably in lighting their shops with them. I also hear that a cotton-mill in this neighborhood is lighted up with gas. A long account of the new lights was published in the newspapers some time ago, in which they had the candour to ascribe the invention to Mr. Murdoch. From what I have heard respecting these attempts, I think there is full room for the Soho improvements, though, when once they see one properly executed, it will have numerous imitations."

Several years after the introduction of the new light, a German named Wintzer or Winsor, brought out (in 1809) a scheme similar to one projected in Paris by Le Bon,

for lighting the streets by gas. He proposed a Joint Stock Company, with a capital of £300,000 and held forth to subscribers the prospect of a profit of ten thousand per cent! He applied to Parliament for a Bill, against which Murdoch petitioned, and was examined before the Committee. Though they were staggered by the crudities of Winsor, they had some difficulty even in accepting the more modest statements of Murdoch as to the uses of coal-gas for lighting purposes.

"Do you mean to tell us," asked one member, "that it will be possible to have a light without a wick?" "Yes, I do indeed!" answered Murdoch. "Ah, my friend," said the legislator, "you are trying to prove too much." It was as surprising and inconceivable to the honourable member as George Stephenson's subsequent evidence before a Parliamentary Committee to the effect that a carriage might be drawn along a railway at the rate of twelve miles an hour without a horse.

No wonder that strange notions were entertained about gas in those early days. It seemed so incredible a contrivance, to make air that could be sent along pipes for miles from the place at which it was made to the place at which it issued as jets of fire, that it ran entirely counter to all preconceived notions on the subject of illumination. Even Sir Humphry Davy ridiculed the idea of lighting towns with gas, and asked one of the projectors if it were intended to take the dome of St. Paul's for a gasometer. Sir Walter Scott also made many clever jokes about the absurdity of lighting London with smoke, although shortly after he adopted the said "smoke" for lighting up his own house at Abbotsford. It was popularly supposed that the gas was carried along the pipes on fire, and hence, that the pipes must be intensely hot. Thus, when the House of Commons was first lighted with gas, the architect insisted on the pipes being placed several inches from the wall for fear of fire, and Members might be seen applying their gloved hands to them to ascertain their temperature, expressing the greatest surprise on their being found as cool as the adjoining walls.

The advantages of the new light, however, soon became generally recognized, and gas companies were established in most of the large towns. Had Murdoch patented the discovery, it would have proved exceedingly remunerative to him; but he derived no advantage from the extended use of the new system of lighting except the honor of having invented it,—though more than one attempt was made to deprive him even of this honor. As he himself modestly said, in his paper read before the Royal Society, "I believe I may, without presuming too much, claim both the first idea of applying, and the first actual application of this gas to economical purposes."

Murdoch's attention was, however, diverted from prosecuting his discovery of the uses of gas to a profitable issue, by his daily business, which was of a very engrossing character.

Many more inventions can be justly claimed for Murdoch, but it is chiefly his work on gas that has made his name honored in the gas industry.

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The Ten Commandments Which Lower Maintenance Costs in Fleet Operation

By
Fred E. Kunkel

"ONE day when I was looking over our maintenance costs for the year and scanned our accident record, it occurred to me that if the garage superintendent could have constant touch with the fleet operators and gain their good will and cooperation, we might be able to impart some useful knowledge which would assist us in lowering our maintenance costs as well as reduce our accidents", said the garage superintendent of a gas company, recently interviewed.

"After all, our operators are not mechanics. To them a motor vehicle is simply a means of transportation. They do not reach into their own pockets to pay for gas and oil, nor do they have to buy a new set of tires or a battery. If the brakes have to be relined or a new clutch put in, they never see the bill of costs. So, quite naturally, they were not interested in economical operation but simply in transportation.

"And the thought occurred to me that it would be a good idea to tell them something about our maintenance problems with a view to enlisting their cooperation and so get across to them some good mental pictures which would help us both.

"I decided to take up one subject at a time—the most important things first, and so on down the line until I had told them the story of maintenance and safe operation from the garage standpoint. I classified the material and conceived the idea of calling my talk *The Ten Commandments of Lower Maintenance Cost and Safety Operation.*

"As I went to the meeting each time I would take one of my sheets, say the *First Commandment*, and then at the next meeting I would take up the *Second*, and so on. I just talked about one thing at a time and to the point. In my judgment it is not a good idea to give them too much at a single sitting. I did not want to overtax their attention interest by making the talks too long.

Cooperation Essential

"I told them I was giving them the best truck that it was possible to turn out, in perfect mechanical condition, but I wanted their cooperation and in fact I had to have that, and they would have to do their part in order to give them a good truck. I read off each commandment and then I would thoroughly explain the operation and the different parts involved, say the clutch or the brakes, or I might talk about cold weather operation (in winter) and about hot engines (in summer) and so on.

"For instance, we were having a lot of clutch trouble. I explained to them just what was happening. 'Often you fellows are delayed in the morning and you are in a hurry to get going. Being in a hurry there is a little anxiety to speed up and with that a lot of you men will get your foot up against the clutch pedal and you will be slipping your clutch, or cause your clutch throw-out wipers to wear out unnecessarily. Bear this in mind tomorrow morning and see if you can catch yourself doing the wrong thing.'

"They took this to heart and caught themselves doing it, and so broke themselves of the habit. As a result our clutch problems and clutch expense disappeared.

"Another thing I spoke about was safety, to take plenty of time to stop at intersections, never trying to make quick stops. 'In doing that you are saving your brakes and saving the truck in general', I told them.

"'Another thing is at traffic lights. It may be too much trouble for some of you to put your foot on the brake. You try to hold it with the clutch. That is a very bad prectice. Now let's cooperate in these little things and see whether we cannot save the company some money.'

"And the result was that they were soon trying to find out what the next commandment was going to be, and were very much interested in these talks. A lot of them said I had told them a lot of things they had never given much thought to, and that it was a big help to them.

"They cannot talk our language mechanically, but by having that contact with the operator, you can impart good advice that is appreciated, get their good will, and have them working with you. And this has been the means of being in constant touch with the operator which is a big item in more economical maintenance. By having that personal contact there is always some good knowledge you can impart. It has saved us plenty of money and resulted in much lower maintenance costs."

The Ten Commandments

Here are the ten commandments for lower maintenance costs and safety operation:

I

Before starting the motor, be sure to disengage the clutch as starting the motor with the clutch engaged causes transmission gears to churn cold lubricant in transmission, resulting in a heavy drag on the battery.

When starting the motor, give ample time to heat up, without racing before starting the car.

If the motor is put in operation before the oil has had a chance to heat up and function properly, connecting rod and main bearing failures can be expected.

Avoid excessive use of choke. Motor operated with choke out enriches the mixture to such an extent that it will impair the lubricating qualities of the oil, causing excessive piston ring and cylinder wall wear.

Do not put water in radiator when motor is hot, let motor cool off. Then pour water in while motor is running, to avoid having cracked blocks.

II

Always use all gears in transmission when starting—start in low, not in second or high.

Metals are more susceptible to failure in cold weather which may result in broken transmission gears, pinion or ring gears.

In changing direction, either backward or forward, bring the car to a stop before changing gears.

If these instructions are not carried out, the result will be broken transmission gears, axle shafts, drive shafts and distorted rear axle housings.

When in congested traffic shift down to a lower speed to accelerate or when driving slowly, never wait until the engine begins to labor or knock before making the gear change.

Also when climbing a grade, shift to a lower gear as soon as the engine

shows any indication of laboring.

When roads are slippery have the wheels revolving slowly to get traction and avoid spinning.

III

Keep the oil up to the proper level and examine the level frequently, especially on long trips.

When you hear squeaks try to determine where these are located and report same.

Do not allow the engine to misfire continually.

When a cylinder misfires, the engine must be overhauled to develop its rated capacity, and this ultimately means a break-down.

IV

Handle the vehicle with the throttle in anticipating a stop, to conserve the life of the brakes.

In emergencies push down pedals at the same time and pull back on the hand brake lever.

If the roads are slippery, use good judgment to avoid a skid.

Emergency stops are rare with the skillful driver.

When brakes are wet and not holding, run with the brakes slightly applied for a short distance.

This will dry the brake lining and you will find your brakes taking hold.

To avoid skidding apply brakes and slow down before releasing the clutch.

V

When necessary to have the vehicle towed or when necessary to tow another vehicle, attach the tow line to the frame when possible and not to the axle.

Also attach the tow line so that an even pull is obtained.

Allow sufficient length of tow line between the two vehicles to permit proper control of both vehicles.

VI

Slow down for turns and at road intersections. It saves the tires and avoids the danger of skidding.

Keep your tires properly inflated and do not drive on a flat tire. It takes but a short distance to completely ruin an inner tube and a tire.

Use good judgment in the use of the non-skid chains. Remove them as soon as conditions permit.

VII

In descending hills, use the engine as a brake, that is run on compression and prevent heating the brakes.

Apply hand and foot brakes alternately on long hills.

When leaving the vehicle, always set hand brake and stop the engine.

If you are on a grade turn the front wheels toward the curb, and also shift into gear.

VIII

It is your duty to make deliveries in the shortest possible time, but you are also requested to consider the possibilities of break-downs and the great delay caused by taking chances on the road.

Avoid speeding. Less haste means greater speed in the long run, especially when roads are bad.

IX

Make it a habit to examine the gas, oil and water supply before starting out.

Study the action of the vehicle while you have it on the road, and report promptly any deviation from the normal standard of performance.

The operator has greater opportunity to detect trouble than is presented on the garage floor.

X

Avoid getting stuck in muddy roads. If you do get stuck, do not let the clutch in with a jerk and spin the rear wheels, as this will only force the wheels in deeper.

Allow the clutch to engage gradually and the motor to run as slowly as possible to prevent stalling, thus turning the rear wheels as slowly as possible in order that maximum traction may be had.

Knowing how to prevent troubles requires merely common sense.

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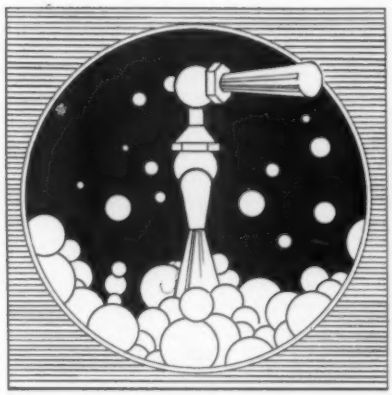

By
George L. Scofield
New Business Manager,
Republic Light, Heat & Power Co., Inc.,
Buffalo, N. Y.

ARE you caught in the tide of declining domestic gas revenues, the most profitable end of your business? This dangerous trend existed generally in the manufactured gas business in Canada and the United States, as reports from the industry show a drop in domestic gas revenues from $315,000,000 in 1930 to $255,000,000 in 1937—a reduction of 19%. During 1938 a negligible increase of 1.6% was shown by the industry, but in many communities declining domestic revenues still prevail.

What are the major forces which have taken over part of your domestic load in spite of the fact that gas still is the best fuel for Cooking, Water Heating and Refrigeration? Let's take a look at them: a change in living habits of your customers, increased efficiency of our gas appliances, and the aggressive competition of the electric industry.

True enough, you say, some companies through changes in the lower brackets of their gas rates have been successful in adding sufficient new Commercial House Heating and Industrial Load to more than overcome the loss in their domestic business. Do you consider such a step the answer when those companies, like the industry as a whole, have permitted their bread and butter load, their domestic business, to slip away? The short sightedness of that policy is shown by the fact that while total gross revenues of the Manufactured Gas Industry declined from $412,000,000 in 1930 to $357,000,000 in 1937, net earnings shrank from $84,000,000 to $24,000,000. In other words, a reduction of $55,000,000 in gross, and only an increase of $10,000,000 in operating expense, taxes and interest charges, resulted in a decrease of $60,000,000 in net.

Today we are, therefore, confronted with the serious problem of rebuilding our domestic revenues and increasing our net. What can be done about it? It is not feasible to change the living habits of our customers by reverting to the good old days when nearly every homemaker religiously baked her own bread and cakes and preserved all her own vegetables and fruits. It would be folly to reduce the high efficiency of gas appliances as we require this increased efficiency to give our customers a modern service at a satisfactory cost. We can, however, revamp our sales policies and swim out of this predicament. . . .

A necessary requisite for adding new load and holding our present domestic business is a gas rate that is competitive to other fuels. The following comparisons are accepted equivalent consumptions of fuels used for domestic purposes, which may act as a guide in determining competitive cooking, water heating and refrigeration costs for the average family in your territory.

The automatic gas water heater, when used on a rental plan and operation cost is reasonable, offers the greatest opportunity to increase your domestic load.

From these comparisons it will be noted for cooking that 70c manufactured gas is equivalent to 1c electricity, and 56c manufactured gas is equivalent to 8 mill electricity. Furthermore, 60c manufactured gas is equivalent to 5 mill electricity for water heating.

Your rate problem cannot be taken too lightly, for ofttimes a rate reduction, effected for the purpose of generally encouraging new business, fails to produce the desired result. The adoption of such lower rates in most cases, not accompanied by an aggressive and successful sales program, is ruinous. The probable solution may be the adoption of new class rates that will not seriously reduce your present domestic revenues, but will attract considerable new load from definite sources in a relatively short period of time.

Today in most manufactured gas centers in Canada, there is rarely a saturation of more than 10% to 20% of automatic gas and electric water heaters, and rarely a saturation of more than 20% of automatic refrigerators. Thus, there remain great possibilities for us in this vast undeveloped market, as 80% to 90% of this business has not been scratched

Type of Service	Manfd. Gas 530 B.T.U.	Electric	Lbs. Coal	Imperial Gals. Oil
Cooking	**1.75 M.**	**125 KWH.**		
Refrigeration	**2.00 M.**	**50 KWH.**		
Water Heating supplying 1200 Imperial or 1500 U. S. Gallons Monthly, 100° Rise Storage System	3.75 M.	458 KWH.		
Oil Furnace and Boiler				36 to 45
Furnace Coil, Oil Burner and Boiler				40 to 50
Furnace Coil, Coal Furnace with non-insulated Tank			430	
Jack Pot Stove and Insulated Tank			670	

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by us or our electric competitors. Why not then consider class rates to attract this business?

The company with which I am connected had a similar condition in one of our New York State properties where 540 B.T.U. manufactured gas is served to approximately 6000 domestic customers. After a thorough study, we adopted, in October, 1938, a new class rate for any customer regularly using an automatic gas water heater and/or gas refrigerator. As we had comparatively few gas refrigerators on our lines and only approximately 15% saturation of automatic gas water heaters, the estimated annual loss of $14,124.00 in revenues due to customers transferring to the new rate was relatively small—approximately 7% of our gross domestic revenues.

Our major competition was flat rate electric water heating at a cost of $2.40 to $3.00 monthly. Hot water service furnished by a coil in the furnace using $12.00 coal or $9.00 coke, and Jack Pot stoves using $7.50 coal, cost approximately $2.50 monthly—electric competition for cooking averaged 1½c per K.W.H. To meet this competition, the demand type of rate was deemed the best as it would not affect our Commercial, Industrial and House Heating revenues. It did, however, afford any domestic customer a lower rate if using automatic gas water heating and/or automatic gas refrigeration, or where a customer increases the usage by adding such equipment. This class rate included a demand charge of 2c per 1000 B.T.U. input rating plus gas at a rate of 60c net per M.C.F. The minimum bill is $1.10 monthly, and demands are determined as follows:

Automatic Water Heaters and Refrigerators—

The hourly rated B.T.U. Demand of the installed burners—Minimum Demand 5000 B.T.U.

Gas Ranges—

Each Top Burner on the Range 8750 B.T.U. Demand.

Pilot Lights and Oven Burner are not included.

All ordinary appliances, such as radiant heaters, circulating heaters, laundry plates, mangles, ironers, washing machine burners, etc., are not taken into consideration when determining the demand.

This new class rate applies only to customers using automatic water heaters and/or automatic refrigerators during the entire year. This requirement makes it necessary to remove the furnace coil before a customer is entitled to this rate. Comparisons of this new class rate with our regular domestic rate are as follows:

	Monthly
Automatic Storage Water Heater, 12,500 B.T.U. Input Rating and 4 M.C.F. Consumption:	
Demand Charge (12,500 B.T.U.)	$ .25
Commodity Charge (4 M.C.F.)	2.40
Total Charge, New Rate	$2.65
Monthly Cost, Regular Rate	4.60
Savings, New Rate	$1.95
Average Cost New Class Rate for Water Heating	$ .66
Automatic Storage Water Heater, 12,500 B.T.U. Demand and 4 M.C.F. Consumption. Gas Range with 35,000 B.T.U. Demand and 1.75 M.C.F. Consumption:	
Demand Charge (47,500 B.T.U.)	$ .95
Commodity Charge (5.75 M.C.F.)	3.45
Total Charge, New Rate	$4.40
Monthly Cost, Regular Rate	5.70
Savings, New Rate	$1.30
Average Cost of Gas for Water Heating—New Class Rate	$ .66
Average Cost of Gas for Cooking—New Class Rate	1.00
Average Cost of Gas for All Gas Used—New Class Rate	.765
Gas Refrigerator with 5000 B.T.U. Demand and 2 M.C.F. Consumption:	
Demand Charge (5000 B.T.U.)	$ .10
Commodity Charge (2 M.C.F.)	1.20
Total Charge, New Rate	1.30
Monthly Cost, Regular Rate	3.00
Savings, New Rate	$1.70
Average Cost of Gas used for Refrigeration, New Class Rate	.65
Gas Refrigerator with 5000 B.T.U. Demand and 2 M.C.F. Consumption. Gas Range with 35,000 B.T.U. Demand and 1.75 M.C.F. Consumption:	
Demand Charge (40,000 B.T.U.)	$ .80
Commodity Charge (3.75 M.C.F.)	2.25
Total Charge, New Rate	$3.05
Monthly Cost, Regular Rate	4.40
Savings, New Rate	$1.35
Average Cost of Gas for Refrigeration, New Class Rate	$ .65
Average Cost of Gas for Cooking, New Class Rate	1.00
Average Cost of Gas for All Gas Used, New Class Rate	.81

These new average rates are competitive to electricity for cooking, and also to electricity and coal for water heating in this particular property.

In the past we found other reasons why our customers did not buy automatic gas water heaters in addition to the high operating cost—these were: (1) the necessity of making a large down payment to buy the heater, (2) the obligation of buying the heater on a contract during very uncertain times, (3) the obligation and possibly unsound investment of purchasing an automatic water heater for a rented home where the landlord would not furnish such equipment.

We, therefore, decided to adopt a trial rental plan for automatic water heaters to eliminate the fear of high gas bills and to overcome the three other common objections to the purchase of automatic water heaters, especially by tenants, who represent approximately 50% of our customers and who seldom had purchased automatic water heaters.

The water heating equipment selected for our rental activity comprised a medium recovery automatic tank heater and three sizes of medium and high recovery automatic storage systems. The automatic tank heater has a thermostat located in the inlet of the coil—we find this heater is very popular, especially with tenants, as the rental is low and it is quickly installed without moving the owner's range boiler. The addition of strapped-on insulation completes the installation, which has proven to be very satisfactory, as the hot water delivery is faster than with an ordinary storage type water heater. This automatic tank heater installation is rented at 35c a month, and, exclusive of installation costs and commissions, it will be amortized in approximately sixty months. The installation and commissions are charged to operating expense.

Where a customer has no tank or range boiler, or where such equipment is not in satisfactory condition, automatic storage systems are being rented at the following monthly charges:

20 U. S. Gallon Model with Galvanized Tank	$ .70
30 U. S. Gallon Model with Galvanized Tank	.85
40 U. S. Gallon Model with Galvanized Tank	1.00

These automatic storage systems

will also be amortized in approximately sixty months, exclusive of installation charges and commissions.

Our rental plan permits this equipment to be placed on a 30 day proof trial in a customer's home, after which it may either be rented or purchased at our regular price for cash, or at a slightly higher price on terms over a period of time not to exceed thirty-six months. The renter has the option to purchase the heater any time within thirty months after date of installation with full credit for rentals paid to apply against the purchase price.

Our salesmen are paid a rental commission of $4.00 on the automatic tank heater, $5.00 on the 20 U.S. gallon storage system, $6.00 on the 30 U.S. gallon model and $7.00 on the 40 U.S. gallon size. Sales commissions are approximately 50% higher than these rental commissions, and when a salesman converts a rental into a sale, he will be paid the difference in these commissions. To encourage our salesmen to add new load instead of changing over obsolete gas equipment only, bonuses ranging from $2.50 to $5.00 are also paid in addition to commissions for the replacement of competitive fuels. If the water heater is returned before six rental monthly payments are made, the total commission and bonus are deducted from the salesman's compensation. If, after six and before twelve rental payments are made, 50% of the salesman's total commission and bonus is deducted, but after twelve monthly rentals are paid, no charge-back is made.

To secure the assistance of operating employees, lead commissions of $1.50 are paid for productive leads, which are deducted from the salesman's commission and bonus. Dealers are being encouraged to co-operate and are receiving a commission on their rentals. The dealer further has the option of installing the heater at a nominal installation fee in addition to his commission. This dealer co-operation is proving very helpful.

Since the inauguration of our rental activity, just seven months ago, we have secured 566 new water heating installations, which are equivalent to all the water heaters sold in this property during the past six years. Reverts to date average only 10% of the total rentals for various reasons—few of them being for the old complaint, "high cost of operation." We fully expect at the close of the first year's operations through the installation of 850 rental water heaters to more than regain our loss of $14,124.00 annually in gross revenues incurred by the rate cut. We, furthermore, anticipate by continuing this program in 1940 and installing five hundred additional automatic water heaters that we will show increased net earnings at the close of that year and for each year to come.

Other companies, too, are finding the rental plan of water heaters very helpful. Mr. Davis DeBard, Vice-President of Stone & Webster, reports securing three to seven times as many water heating installations on a rental plan as were made with a straight sales plan with terms not to exceed twenty-four months. His rental plan gives the customer the option to purchase the equipment for cash at any time at a discount of 10% on the balance remaining after rentals are deducted, or to continue to pay rental until the sales value and carrying charges are paid, when the heater becomes the property of the customer. Returns have not exceeded 10%—are chiefly due to customers moving to other districts. As there is no style obsolesence in automatic water heaters, the heaters taken back are easily cleaned and then re-rented.

Mr. Henry Hubbard, Vice-President of the Crystal City Gas Company, Corning, N. Y., a natural gas company, serving 5122 customers, reports his company has installed 1262 automatic gas water heaters during the past four years, or approximately one heater to every four customers. This makes their present saturation of automatic water heaters nearly 50%. Automatic storage water heaters equipped with galvanized tanks up to the 40 gallon size are rented at a charge of $1.00 monthly. Due to the low operating cost, approximately $1.60 monthly, and to their success in re-renting equipment in property vacated by a renter, only thirty-nine units have been removed during this four year period. Mr. Hubbard further states their success in securing this high saturation of automatic water heaters is due to the fact that they have been able to place heaters in properties that are rented and occupied by tenants who, while they would not think of purchasing an automatic water heater for a rented home, are willing to rent one.

The Rochester Gas & Electric Company of Rochester, New York, with 93,000 customers, now have approximately 17,000 automatic storage systems on their lines. Approximately 6728 of these installations have been secured in the past twenty-eight months since the start of their rental plan in January, 1937—sixty-one hundred and eighty-seven (6187) of these installations are rentals and five hundred and forty-one (541) are outright sales. Dealers are responsible for 15% of all installations. Net returns amount to only approximately 10%.

This Rochester plan calls for the installation of copper storage water heaters of either a 20 or 30 gallon size at a rental of $1.00 monthly. Salesmen's bonuses are based on what the rental water heater replaces as follows:

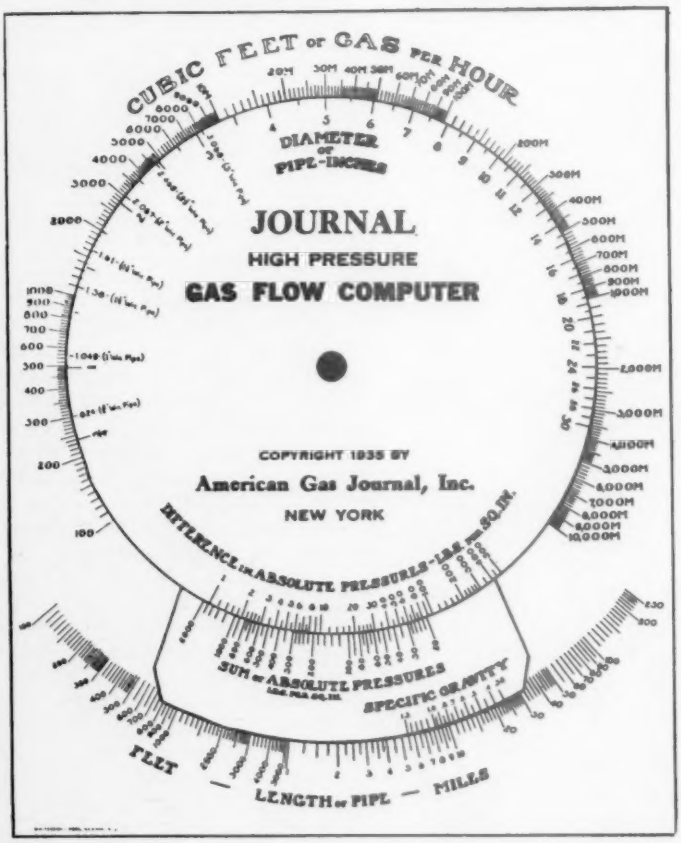
1. Non Gas Burning Equipment...	$10.00
2. Tank Heater in Combination with Other Water Heating Equipment	9.00
3. Tank Heater Only	7.00
4. Automatic Storage System.....	5.00

The customer has the option during the first thirty-six months to purchase a new heater with full credit for the rentals paid on the old heater. Where the same heater installed is retained and purchased, an additional allowance of $8.00 is made—this reduction being equivalent to the cost of installing a new heater.

Mr. G. S. Dawson of the British Columbia Electric Railway Company, Vancouver, B.C., reports approximately twenty-one hundred automatic storage water heaters in use at the close of last year. Over seventeen hundred of these installations have been secured since the inauguration of their activity in May, 1937, or approximately twenty-one months. During the four year period previous to the adoption of their present rental plan, only approximately four hundred storage water heaters were sold. In other words, instead of selling one hundred heaters a year, this company is now renting heaters at the rate of eight hundred a year. Returns are running only 8%. Revenues from these water heating customers now total to approximately $68,000 annually as compared with water heating revenue of $4,744 annually, just four years ago. Their gas rate is 75c per M.C.F. for 465 B.T.U. Gas. The water heating equipment used are monel metal storage systems, which rent at 50c monthly for the 16 Imperial gallon size and 75c for the 25 Imperial gallon model.

Generally, companies that are successful in the promotion of water heaters are using a rental water heater plan combined with competitive or attractive gas rates. To be successful in this promotion, abundant, ever-ready, gas hot water service for the average family should not cost the customer more than $2.50 a month, and where competition at a lower cost exists, it must be met. Furthermore, the monthly rental charge for the water heating equipment must not be excessive.

"Journal" Gas Flow Computers



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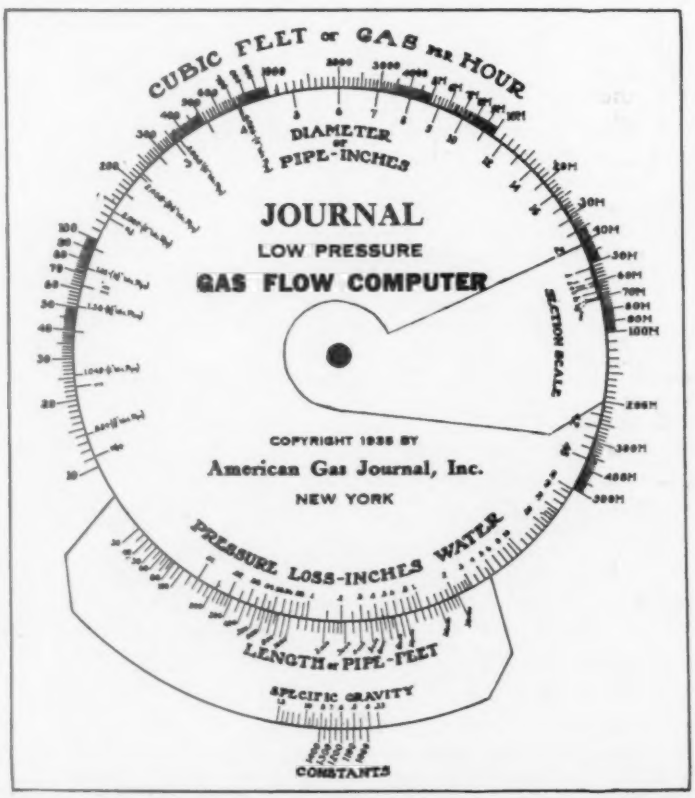

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Book Reviews

[*Arc Welding in Design, Manufacture and Construction. Compiled and Published by The James F. Lincoln Arc Welding Foundation. 1408 pages, 695 illustrations.*]

The book is priced at $1.50 per copy, postpaid anywhere in the United States, $2.00 elsewhere. Copies may be secured by writing The James F. Lincoln Arc Welding Foundation, P. O. Box 5728, Cleveland, Ohio.

109 original studies of welding by acknowledged leaders in various branches of industry are contained in the new book, "Arc Welding in Design, Manufacture and Construction", just published by The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. These studies are the outstanding papers of the recent $200,000 Award Program.

Decision to publish "Arc Welding in Design, Manufacture and Construction" was reached by Trustees of the Lincoln Foundation at a meeting last fall. Feeling that the award papers constitute a large and valuable source of scientific study, research and information on welding, the Trustees decided to make the material generally available.

"Arc Welding in Design, Manufacture and Construction" provides scientific and technical schools, colleges and universities, engineering bodies and libraries, as well as industrial executives and officials, a tremendous volume of data on welding. The book will also be of great value to designers, engineers, architects, production officials and others desirous of obtaining the benefits attributed to arc welded construction.

With few exceptions, the papers are reproduced in complete form. Only those which were too lengthy for inclusion in their entirety are in the form of comprehensive briefs. All photographs and drawings essential to a clear and adequate presentation of each subject are included. Each study includes designs, calculations, procedures and other pertinent information showing how the advantages attributed to arc welded construction are obtained.

[*Dictionary of Scientific Terms by C. M. Beadnell. Chemical Publishing Company of New York, Inc. 1939. 235 pages. Price $3.00.*]

This is a book of reference rather than a dictionary pure and simple. It contains facts concerning cosmic rays, dwarf stars, the density of space, the mysteries of life and sex, the fertilization of flowers by snails, bats, and birds.

It tells in simple language of hormones and vitamins, of wave-lengths, of the size and weight not only of the smaller entities—protons, electrons, and atoms—but also of the larger—the Earth, the Solar System, and the Milky Way.

It describes heavy hydrogen, heavy water, and heavy ice; chemical elements that are changeable into other elements; elements, on the one hand, that have had a span of existence of countless millions of years, and, on the other hand, that vanish in a few hours, in a minute or two, or it may be, in an infinitesimal fraction of a second, after their birth.

New Book on Blueprint Reading

A new book entitled "Simple Blueprint Reading with Particular Reference to Welding and Welding Symbols" is announced by The Lincoln Electric Company, Cleveland, Ohio.

While it has been compiled and published primarily for welders, it contains information of value to anyone concerned with mechanical construction. Its object is to provide information and instruction on the reading of blueprints and drawings. The book affords a basis for study which, together with practice in the actual reading of drawings, will guide the student to proficiency in this important subject.

Since the most successful and economical use of arc welding requires the ability on the part of the welder and other mechanics concerned to carry out the wishes of the designer, it is essential that the welder and such mechanics be able to read and understand the various lines, symbols and other markings which the draftsman employs to convey his ideas. By means of the new book the welder and such mechanics can learn with a few hours, spare-time study what it will take many months to pick up in the ordinary course of everyday work.

The book takes the student in easy stages to a clear comprehension and, by following this method of study in the practice of reading, to a complete mastery of this subject. While it is not intended to be an exhaustive treatise on blueprint reading, the book affords a sound basis in the fundamentals. By applying what he learns, and by referring to the book when questions arise, the student will be able to clearly understand the language of the draftsman.

"Simple Blueprint Reading" contains 140 mimeographed pages, 8½ inches by 11 inches, and is bound in durable paper. It is available from The Lincoln Electric Company at $.50 the copy, postpaid anywhere in the United States.

BARBER Gas Pressure Regulators

Barber Regulators have everything that a Quality Regulator must have—compact, attractive appearance in keeping with the modern trend in heating equipment design—high precision standards of manufacture—operate at very low pressure drop. All bronze body, brass working parts. Sizes ¼" to 1½". A. G. A. approved. Write today for catalog and prices on the complete line of Barber Conversion Burners and Regulators.

The Barber Gas Burner Co.
3702-4 Superior Avenue
CLEVELAND . . . . . OHIO

Made in ¼", ⅜", ½", ¾", 1", 1¼", 1½" and 2" sizes.

GAS SERVICE STOPS

SINCE 1869 Hays has built dependable brass products for the Gas Industry. Standard, Special Weight, Heavy Pattern and High Pressure Stops to meet all requirements are manufactured by Hays in a full range of sizes. Write for Catalog No. 4 today.

HAYS MANUFACTURING CO. ERIE, PA.

News of the Gas Industry

The Canadian Gas Association Holds 32nd Annual Convention

The thirty-second annual convention of the Canadian Gas Association was held at Hamilton, Ontario, June 6 and 7. T. P. Pinckard, Pres. of the Association made a short address, and then appointed J. D. Von Maur as chairman to introduce the various speakers.

The program was an excellent one and the papers discussed a wide variety of subjects.

Rental Plan for Gas Water Heaters, George L. Scofield, new business manager, Dominion Natural Gas Co., Ltd., Buffalo, N. Y., appears elsewhere in this issue; The Electric Bogey, Frank D. Howell, divisional superintendent, Dominion Natural Gas Co., Ltd., Brantford; Management and Corrosion, Erick Larson, New York; The Natural Gas Industry of Alberta, Julian Garrett, general manager, Northwestern Utilities, Ltd., Edmonton; Personnel and Public Relations, George R. Huxtable, comptroller, Ottawa Gas Co.; Maintenance of an Underground Piping System, P. W. Geldard, assistant engineer of distribution, Consumers' Gas Co. of Toronto; Medium-Pressure vs. Low-Pressure Distribution for a City with Relatively High Customer Demand, Barclay W. Pitfield, assistant engineer, Northwestern Utilities, Ltd., Edmonton; Getting Behind the C P Gas Range, R. S. Agee, sales promotion manager, Association Gas Appliance and Equipment Manufacturers; Air Conditioning and House Heating, James R. Scott, manager, Winter Air Conditioning Department, Surface Combustion Co.; Gas in Industry, James A. Ward, industrial engineer, Republic Light, Heat & Power Co., Buffalo, N. Y.; The Gas Industry's Participation in the New York World's Fair, read by T. G. Jeffrey, sales manager, Ruud Manufacturing Co. of Toronto.

John McLaverty, sales promotion department, Consumers' Gas Co. of Toronto, commemorated the hundredth anniversary of the death of William Murdoch, founder of the gas industry, and outlined his life and work.

Canadian representatives elected to American Gas Association for the ensuing year include: G. R. Huxtable, Ottawa; J. D. Von Maur, Toronto; J. H. Wheatley, Montreal, and D. H. Thorburn, Hamilton.

The President's reception and banquet was held Tuesday evening. There were about 150 in attendance.

Officers for the coming year were elected Wednesday, as follows:

President—Julian Garrett, General Manager, Northwestern Utilities, Ltd., Edmonton, Alberta.

1st Vice-Pres.—J. B. McNary, General Manager, Canadian Meter Co., Ltd., Hamilton, Ont.

2nd Vice-Pres.—John D. Price, Manager, Montreal Coke & Mfg. Company, Montreal, Que.

Secretary-Treas.—G. W. Allen, Gas Survey Engineer, 7 Astley Avenue, Toronto 5, Ontario.

The 1940 Convention will be held in Jasper Park Lodge, Alberta, July 3rd to 5th.

A.G.A. Plans New Pacific Coast Branch Laboratories

In view of the increased volume of appliances submitted to the Pacific Coast Branch Testing Laboratories for approval in recent years and particularly in the last year, the present accommodations at 718 Towne Avenue, Los Angeles, California, have become inadequate to meet the added demands of the industry. Although the number of testing engineers has been augmented, it became necessary some time ago to rent additional space in another building for storage purposes. For this reason, a survey of possible new locations for the Laboratories was conducted during the last year by Mr. A. F. Bridge, member of the Laboratories' Managing Committee, and Mr. F. O. Suffron, of the Laboratories' staff.

On Saturday, May 13, 1939, the Laboratories' Managing Committee met in Los Angeles to consider the feasibility of purchasing a satisfactory ground site and constructing a new building thereon as contrasted with the lease or purchase of an existing building.

Of all the sites visited by the committee, the Hostetter Tract located on the corner of Downey Road and Eleventh Street and approximately 5 miles from the center of Los Angeles, was deemed most desirable. This property comprises approximately 21,000 square feet and is located in a district with definite building restrictions.

The Executive Board of the American Gas Association at its meeting held May 15, 1939, approved the purchase of property and erection of a new laboratory building thereon. Messrs. A. F. Bridge and R. M. Conner were appointed a committee of two with power to act in the purchase of a site and consummation of all proposed plans for the construction of the new laboratory building.

The Hostetter Tract was purchased on May 29, 1939. Arrangements were made with the Southern Counties Gas Company of California to supply the necessary engineering and supervisory assistance in the construction of the new laboratory.

Tentative plans provide for an earthquake-proof structure with approximately 10,000 square feet of floor space incorporated in a building of the most modern design. This proposed new structure will provide more than twice the floor space afforded by the present leased quarters and thus insure ample gas appliance testing facilities for the Pacific Coast section of our industry for some time to come.

Dinner held in the Gas Exhibit at the Golden Gate International Exhibition on the evening of May 15. This was a dinner given by the Pacific Coast Gas Association to the members and guests of the American Gas Association's Spring Executive Conference.

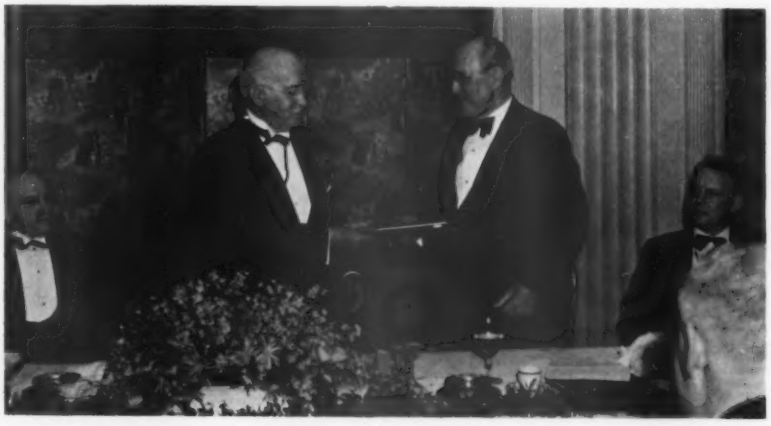
Baltimore Makes Second Industrial Survey

Baltimore's second Industrial Survey was presented to the community at a dinner given on June 5th, by Herbert A. Wagner, President of the Consolidated Gas Electric Light and Power Company of Baltimore, at the Baltimore Country Club at which a group of the leading business men of Baltimore and industrialists from other cities was present.

Since the latter part of 1938 a research staff of the Consolidated Company has been at work on the Survey acting under the guidance of an advisory committee consisting of William J, Casey, Chairman, J. E. Aldred, Howard Bruce, E. Asbury Davis, James E. Hooper, Charles P. McCormick and Frederick W. Wood.

clearly the factual reasons for the remarkable expansion of business during the past quarter-century in the Baltimore Area in contrast to the country as a whole and other eastern seaboard cities in particular and provides useful information for Baltimore and manufacturers in other cities concerning Baltimore's geographic location, physical facilities and economic position. Its objectives are far wider than a mere assurance concerning conditions as they exist at the moment."

Baltimore's growth between 1914-1937, as revealed by the Survey, shows that the value of manufactured products is up 211%; manufacturers wages up 216%; number of wage earners employed by



Herbert A. Wagner, President, Consolidated Gas Electric Light and Power Company of Baltimore, presents the Second Industrial Survey of the City to Mayor Howard W. Jackson. The Mayor accepts it on behalf of the community.

In 1914 the first thorough industrial survey to be made in any major city in the United States was made in Baltimore. It was known as the Aldred Survey, having been projected and carried to successful conclusion through the efforts of Mr. J. E. Aldred. The 1914 Survey introduced to students of social and economic science a new element in the study of community problems. The Survey of 1939 carries much further this research applying to the problems in systematic and social development in the great centers of population in this country.

"The Survey" said Mr. Casey "presents

manufacturers up to 31%; wholesale trade up 130%; retail trade up 163% and population of Baltimore's Industrial Area up 43%. Port activity, as revealed by the Survey, shows the total of waterborne commerce up 162%; total cargo tonnage up 113% and number of overseas steamship lines up 233%. "Since 1914, Baltimore's industrial growth," the Survey states, "has greatly exceeded the growth of the United States as a whole; has far surpassed other seaboard cities such as Philadelphia, Boston and New York and has also surpassed such inland cities as Pittsburgh, Chicago, Buffalo and Cincinnati."

Gas Measurement Short Course

The Second Annual Appalachian Gas Measurement Short Course will be held at the School of Mines, West Virginia University, Morgantown, W. Va., on August 21, 22 and 23, 1939. The success of the First Appalachian Gas Measurement Short Course in 1938 gave encouragement to the holding of a second in 1939. Instruction will be provided in the theory and practice of gas measurement and pressure regulation, including the various types of equipment used. The subjects that will be presented will be of interest not only to metermen, but to managers and executives of producing, distributing and consuming companies.

Frank L. Chase Retires From Lone Star Gas Co.

Frank L. Chase, for thirty-eight years an outstanding leader in the natural gas industry, on June 1 announced his retirement as vice president of Lone Star Gas Company, Dallas, Tex. Elmer F. Schmidt, who was elected vice-president of the Lone Star in 1936 and who had served as general superintendent since 1920, has been appointed operating manager to succeed Mr. Chase.

High tribute to Mr. Chase was tendered the retiring vice-president by executives and department heads of Lone Star Gas system at a testimonial luncheon in Dallas June 5. In recognition of his twenty-two years service with the organization and as evidence of their esteem, his associates presented him with a watch. The presentation was made by L. B. Denning, Sr., president of Lone Star, who had been intimately associated with Mr. Chase since

Frank L. Chase

they both entered the gas business in Ohio more than thirty years ago.

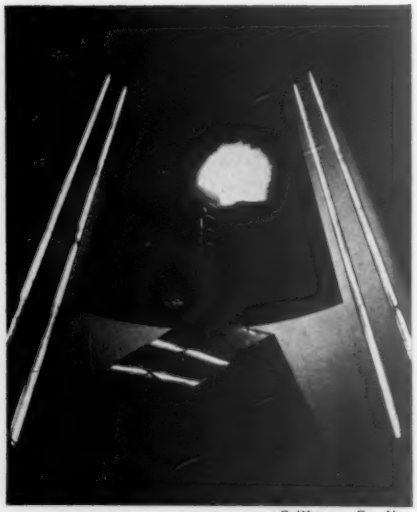
Mr. Chase's outstanding contributions to Lone Star during his long service with the company were outlined by Mr. Denning and others at the luncheon. Emphasis was laid on the major role Mr. Chase played in developing Community Natural Gas Company, the distribution company which pioneered in bringing natural gas to small, widely scattered communities in Texas and Oklahoma, and on his development of gas reserves for the Lone Star.

A graduate of Massachusetts Institute of Technology, Mr. Chase entered the employ of the New York Central Railway and as engineer of structure for the line built most of its bridges from New York to Chicago. He entered the gas business about 1900 in executive charge of eight companies which served Dayton, Springfield and towns in the Miami Valley of Ohio. In 1917 he came to Lone Star Gas Company, and his engineering skill and broad gas experience were vital factors in helping the struggling Texas Gas company locate additional gas supplies. Under his supervision the gas measurement department of Lone Star was organized. As operating manager, for twenty-two years he has had direct supervision of production, pipe lines, compressor stations, gasoline plants and telephone system for Lone Star.

Mr. Chase will maintain an office in the Lone Star Gas System headquarters building, Dallas.

J. D. Taylor Appointed to Central Florida Gas Corp.

J. D. Taylor has been appointed manager of the Central Florida Gas Corp., Bartow, Fla., office. While a native of New Jersey, Mr. Taylor has spent many years traveling in the South in connection with his gas industry activities. He has spent his entire adult life in the gas industry and gas appliance business, and he says "This is the first time I have had an opportunity to settle down as an office manager."



Stillman Studios

Night view of two of the four 90 foot illuminated pylons surrounding the Court of Flame at New York World's Fair. The central gas flare, wind blown in this picture, shoots high when the air is still.

Laboratories' Engineer Honored

At the June 1, 1939, meeting of the Junior Division of the Cleveland Engineering Society, Mr. George J. Pacanovsky, engineer in the research department of the A. G. A. Testing Laboratories, was awarded the Leadership Medal for his distinguished services as chairman during the last year. This is the second year in which Mr. Pacanovsky has been singularly honored; last year he received the Distinguished Service Medal from this society.

Although associated with the Laboratories for less than a year, Mr. Pacanovsky has participated in several of the research projects recently completed by them. At present he is engaged in a study of the use of parallel thermocouples for the various temperature measurements encountered in gas appliance testing and research work.

Two Laboratories' Engineers Enter Industry

After three years of service with the American Gas Association Testing Laboratories in several capacities, Stanley F. Jaros and Donald E. DuPerow have resigned to become associated with member manufacturer companies.

Mr. Jaros has served in both the testing and research departments of the Laboratories. This experience has afforded him an excellent background for his new responsibilities as Heating Engineer for Servel, Inc., Evansville, Indiana.

Mr. DuPerow has also had a thorough training in various departments of the Laboratories. After about two years spent in testing work, he was promoted to the inspection department, where he has been engaged for the last year and a half. He has joined the staff of the Lincoln Brass Works, Inc., Detroit, Michigan, as Engineer.

Did You Say: "Four Big Jobs?"

When you think of gas, you usually think of cooking, refrigeration, water heating and house heating. But let's see what happens in the course of a normal day and how gas enters into our everyday life.

Your alarm rings. Its Japanned face and numbers have been baked in a gas fired oven; its springs have been tempered by gas fired furnaces, and its wheels and gears have been made by melting and mixing copper, zinc and tin in gas fired furnaces.

Then your bath. The glistening tiles on the floor and wall have been baked in gas fired kilns. Even the enamel on the tub has been made by melting special rock, lime and soda ash in a gas fired furnace at 2,300 degrees. Gas was used in silvering the mirror and gas tempered your razor blades.

Your clothing is dyed with colors that come from gas by-products distillates and from these same distillates come the basis of the powders that make our women beautiful.

That elegant gas range in your kitchen is the result of various heat treatments with gas. Even the food. Your coffee has been roasted by gas. Gas baked the bread, gas cured and smoked the bacon and the eggs probably were laid by a hen that was hatched in a gas fired incubator. And as you read your morning paper . . . remember that gas melted the stereotype metal that made your newspaper possible.

The car you drive to work is another job for gas. Gear teeth, piston rings, crankshaft, piston rods, cams, bolts and nuts all have undergone gas treating. Even the finish is dried in gas heated ovens.

And at work . . . the steel furniture, the parts of typewriters, adding machines, pens, clips, etc., etc., have been treated with gas.

You pay for your lunch with coins that contain specie melted by gas. At home when you have supper, remember that gas glazed the china, forged, heat treated and plated the silver, and melted the glass.

As you listen to your radio—think of gas that helped make the tubes, gas melted the glue that holds the cabinet together and gas heat treated the various metal parts . . . gas even helped to anneal the copper wire used for your aerial.

And as you go to bed, you turn out the lights. Keep in mind that the springs and contacts in the electric switch were melted and formed with gas, as were the springs, keys and many parts of the lock on your door which you fastened before retiring.

Did you say: "Gas for the *four* big jobs?"—*The Gas Flame, Indianapolis.*

B. H. Wittman Appointed Sales Mgr. Peoples G. L. & C. Co.

Effective June 1st, Bernard H. Wittman was appointed domestic sales manager of Peoples Gas Light & Coke Co. of Chicago. He started as a junior clerk with the Company in 1920 and has advanced through positions of salesman, sales engineer, sales supervisor, director of domestic sales for the north section to his newest appointment.

Home service women of public utility companies in the United States and Europe met at the "Court of Flame" theatre of the Gas Industries Building at the New York World's Fair on Tuesday, June 13th. They are shown above on the steps of the spectacular "Court of Flame." Shown with them are: (extreme right—lower row) George Rector, host of the Gas Industries Building who spoke to the home service women on the ways food is prepared and served at the Fair; and Stanley Finch, World's Fair Co-ordinator for Gas Exhibits, Inc. Mrs. Sally Ambrose, home service director of the Consolidated Edison Company of New York, presided at the meeting.

Reflected in the mirror surfaces of the 10 foot cube in the background, which is poised on one corner atop a circular platform, you read the following:—"This 1000 Cubic Feet of Gas will heat 50 baths."—"This 1000 Cubic Feet of Gas will make 4000 cups of coffee."—"This 1000 Cubic Feet of Gas will freeze 5000 Drinks."

Appliance Sales Soar with Laclede Gas Light Company

First Five Months Show 127 per cent Increase over Same Period of 1938

Laclede Gas Light Company sales curve climbs steadily upward, as appliance sales during the first five months of 1939 top all corresponding periods in the last decade. Figures show a 127 per cent increase over the same five-month period of 1938, and the total gross domestic appliance sales for May reached a new ten-year high of $70,295.40.

Credit for this excellent increase is given to the effectiveness, fine spirit and high morale of the sales crews and the splendid cooperative effort of the entire Laclede organization.

No better evidence of this cooperative spirit could be found than that displayed at a meeting held May 5 at which time the four major divisions of the sales department were christened with new names and given new insignia.

Each sales division has been supplied with buttons carrying the insignia of their respective division. These buttons are in maroon enamel with plated outlines, making a neat and durable emblem.

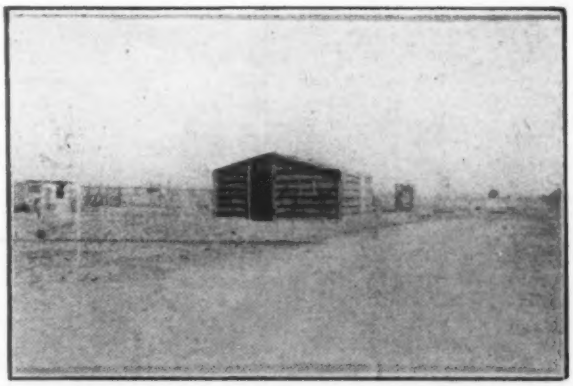
George H. Schlatter, general sales manager, briefly outlined the plan as one which he hoped "would establish friendly rivalry between the four domestic sales divisions of the company and in addition would create greater total sales volume which would naturally result in increased earning power for each salesman and give to others in the company the opportunity of cashing in on sales leads."

Another innovation in the Sales Department is the erection of four large charts, one each for the various rooms in which sales meetings are held. Four colored lines on each chart will indicate the weekly quotas during the month. At the end of each week, emblems will be placed on the charts indicating the extent to which each division made its quota.

Special attention was paid to the outstanding accomplishment of the refrigeration division which already has reached 87 per cent of its annual quota in the first five months of the year. Its aim is to reach its 1939 quota by the end of June, and then really go to work the balance of the year.

The meeting was followed by a buffet supper, prepared by Mary Louise Hurster, Home Service Director, and her capable staff.

$30.00 HOME
IMPROVED WITH $234.40 WORTH OF GAS EQUIPMENT



"Be it ever so humble, there's no place like home" – particularly if it is equipped with natural gas. Such is the house pictured above and the facts surrounding it will, no doubt, be of interest even to Robert Ripley.

According to information furnished us by H. N. Oldham, District Manager of the New Mexico Eastern Gas Company's Carlsbad District, this house and lot, located in Artesia, New Mexico, recently sold for $30.00. Chas. Gaskin, Manager of our Artesia Office, and Joe Hamman, Salesman, promptly called on the new owner of this property and sold the following listed appliances for installation therein:

Piping Job	$ 19.50
Roper Range	153.50
Water Heater	61.40

Who says high grade gas appliances can't be sold to the middle and lower income brackets? We reproduce a page from "Southern Union News," employee publication issued monthly. The gas equipment cost nearly eight times as much as the home.

SUPERIOR GAS METERS

For Sound Values and Continuous Operating Economy. Meters for Domestic and Industrial Use, All Sizes 5B to 60C.

Wet Test and Demonstration Meters
Diaphragms—Service Cleaners
Provers—Meter Repairs.

Superior Meters are built to A. G. A. specifications to provide complete protection against leaks and costly repairs. Write for details and quotations.

SUPERIOR METER COMPANY

167 41st Street ***Brooklyn, N. Y.***

Employee Leads Hit New All-Time Record

Virtually every department in the company is contributing, through the Employee Sales Plan, to the new appliance sales records being reported by the New Business Department of Brooklyn Union Gas Co.

The importance of employees' leads in promoting appliance sales was clearly revealed with the recent announcement that, coincident with the setting of a new all-time sales record in May, leads from employees also reached a new all-time high mark.

Employees submitted 2,599 leads during May to top the previous record, established in the same month three years ago, by 621, or 31 per cent. The number was higher than that for the same month last year by 1,461, or 177 per cent.

Sales resulting from employees' leads also rose to the highest level for any month in company history. Sales totaled 438 appliances—124 above the previous record, which was established in April of this year. As compared with May a year ago, last month's sales as a result of leads were higher by 235, or 116 per cent.

Employees earned a total of $780.45 in lead compensation during May, which was $95.35 above the previous record.

Squier on Committee for Gas Copy Approval

Major T. J. Strickler of Kansas City, Chairman of the A. G. A. Committee on National Advertising, announces the appointment of Wilmot R. Squier, Advertising Manager, Washington Gas Light Company, Washington, D. C., to the Sub-Committee on Approval of Domestic Gas Copy. Mr. Squier has been an active member of the Association's Publicity & Advertising Committee for several years.

Advertising Awards

The Public Utilities Advertising Association announces that Peoples Gas Advertising Department of Chicago won three honorable mention awards in the association's annual Better Copy Contest which is one of the oldest continuous advertising competitions in the country. The awards, which are the same as second place in the judging, were given for load building newspaper advertising; special booklets, pamphlets, etc.; and poster advertising. The first classification was for gas companies while the last two included both gas and electric utilities.

Eastern States Exposition

Reservations already received for the 23rd annual Eastern States Exposition, held annually in Springfield, Mass., have exceeded any previous year. Practically every type of manufactured article is represented. The appeal of the show is in its diversity and varied character of exhibits. More than 300,000 persons visit the Eastern States Exposition annually. There are more than 40 permanent exhibition buildings and special areas are assigned outdoors for heavy duty exhibits and equipment.

CONVENTION CALENDAR

August

21-23 *Appalachian Gas Measurement Short Course.* University of West Virginia, Morgantown W. Va. G. R. Spindler, director.

22-25 *Home Service Conference and Training Course A.G.A.* Los Angeles, Chapman Park Hotel. Gladys B. Price, So. Calif. Gas Co., Chairman.

25-26—*Maryland Utilities Assn.* Annual Fall Convention, Ocean City, Md., George Washington Hotel.

September

6-9 *Pacific Coast Gas Assn.* 46th Annual Convention Fairmont Hotel, San Francisco.

9 *Gas Industry Day,*—Golden Gate Exposition.

October

9 *Gas Industry Day,* — New York World's Fair.

9-12 *American Gas Assn.* Annual Convention, New York, N. Y.

19-20 *Empire State Gas & Electric Assn.* Annual Convention, Westchester Country Club, Westchester, N. Y.

23-28 *National Metal Congress and Exposition.* Exhibit sponsored by A.G.A. Industrial Gas Section included.

26 *Midwest Industrial Gas Sales Council,* Palmer House, Chicago.

INDUSTRIAL GAS BOILERS
GARMENT PRESS BOILERS
100 lbs. ASME Code
¾ to 45 H.P.

P. M. LATTNER MFG. CO.
MAIN OFFICE
CEDAR RAPIDS, IOWA

Panhandle Eastern Pipe Line Company Announces New Contract

Panhandle Eastern Pipe Line Company announced recently the signing of a long-term contract under which Panhandle Eastern will supply the Ohio Gas Light & Coke Co. with all of its natural gas requirements in the towns of Bryan, Edgerton, Napolean, Montpelier, Wauseon, Pettisville, Archbold and Stryker, Ohio, and part of requirements in Delta, Ohio. Initial delivery of gas under the new contract is expected to begin early in June. The contract runs to December 31, 1951, and will continue after that date until twelve months' notice of cancellation is given by either party.

W. F. Perkins Elected to Koppers Board of Directors

Walter F. Perkins, vice president of Koppers Company in charge of its Baltimore operations, has been elected a member of the board of directors of Koppers Company.

Walter F. Perkins

Mr. Perkins joined the former Bartlett Hayward Company in 1915 as an assistant superintendent. He was general superintendent in 1927 when he went to the Worthington Pump and Machinery Corporation, Harrison, N. J., as works manager. He returned to Bartlett Hayward in 1932 as vice president and general manager. He later became president, a position which he held until the company, a subsidiary, was absorbed as a division of Koppers Company in 1936. He has been vice president of Koppers Company since that time and is in charge of the Bartlett Hayward and American Hammered Piston Ring divisions, and The Maryland Drydock Company, a subsidiary. Mr. Perkins is a graduate of Lehigh University, where he received his degree in Civil Engineering.

F. Leslie Fairchild Made President of The Sprague Meter Company

At the Annual Stockholders' Meeting of the Sprague Meter Company, held Wednesday, June 7, the following directors were elected: C. J. Tilden, F. L. Fairchild, A. I. Ayre, Dr. W. F. Hall, R. H. Whitney.

Immediately following the Stockholders' Meeting a Directors' Meeting was held, at which time F. L. Fairchild was elected

Leslie Fairchild

President and General Manager of the Company to succeed the late William P. Hutchinson, with whom Mr. Fairchild had been associated for the past 26 years. Mr. Fairchild came to the Company in 1913 in the capacity of Draftsman, followed by promotion to Chief Engineer, Assistant General Manager and Vice-President.

Other officers elected were Miss A. I. Ayre, Treasurer and Secretary, positions she has held for the past 22 years. Miss N. J. Foley was elected Assistant Secretary and Treasurer.

Nine Commercial Refrigeration Units Employed in Modern Restaurant

The use of gas refrigeration equipment of the commercial type on a large scale is exemplified in the Crosby restaurant at the Carnegie Medical Center Building, Cleveland, Ohio. This was opened to the public on June 13.

The refrigeration equipment consists of nine Servel Electrolux commercial units. The various uses to which these units are put include the operation of storage compartments for the keeping of dairy, meat and vegetable products, maintaining salads and frozen desserts in a fresh condition, preservation of fish, cooling of water and other beverages, and the retarding of dough and preservation of ingredients for the making of cakes in the bakery department.

The commercial refrigeration units operate on the same principle as that of the Servel Electrolux household gas refrigerator.

R. P. Brown Appointed Secretary of Commerce of Penna.

Richard P. Brown was recently appointed by Governor Arthur H. James to be the first Secretary of the new Department of Commerce of the Commonwealth of Pennsylvania. He is Chairman of the board of the Brown Instrument Company and Vice-President of Minneapolis-Honeywell Regulator Company.

Mr. Brown has been interested for some years in the industrial development of Pennsylvania, with the objective of increasing the number of jobs in private industry and thereby reducing the relief load and in turn the taxes necessary to support those on relief.

Mr. Brown's past business training of thirty years devoted to the manufacture of measuring and controlling instruments for use in industry, should stand him in good stead in his new position as Secretary of Commerce of Pennsylvania.

Cutler-Hammer Announces Appointments of Seeger and Harwood

G. S. Crane, Vice-President in Charge of Sales and Engineering for Cutler-Hammer, Inc., Milwaukee, Wis., has announced the appointment of Mr. E. W. Seegar as Manager of the Development Department and Mr. P. B. Harwood as Manager of Engineering Department for the Company.

Pittsburgh Equitable Meter Transfers Arens to New England

F. C. Arens, Jr.

Ferd C. Arens, Jr., who has been with Pittsburgh Equitable Meter Company's New York office, has been transferred to the New England territory of the same company. He will handle the entire line of products made by the Pittsburgh Equitable Meter Company and its subsidiary, the Merco Nordstrom Valve Company, throughout Vermont, New Hampshire, Massachusetts, Connecticut, Maine and Rhode Island. His headquarters are at 16 Fells Road, Wellesley, Mass.

Successful Soap Slogans Win Servel Refrigerators

One index of the enthusiasm with which gas utilities participated in the six-week P&G—Servel Electrolux contest which closed July 2, was the great demand on the part of sales managers for promotional material, particularly the "gas bill inserts." Large quantities of this type of material, amounting in many instances to as many as 100,000 folders each were sent to the large companies.

The Procter & Gamble Company reported that the entries in the contest were three times greater than those received in a similar contest last year.

During the period of the competition, 360 Servel Electrolux refrigerators were awarded to those adjudged the best writers of 25-word sentence beginning "I like P&G White Naphtha Soap because . . . ." The contest was part of the soap company's "Guiding Light" program broadcast over a coast-to-coast NBC network.

ADVERTISING
SALES PROMOTION
PUBLIC RELATIONS

Based on understanding and long experience with the Gas Industry in the fields of equipment utilization and service.

ALFRED FISCHER

271 Madison Ave. New York City

HIGH GRADE

Gas Stops

Factory inspected and guaranteed for ease of operation and freedom from leakage. *Catalog on request.*

G-493—Tee Head Roundway High Pressure Gas Stop

KITSON COMPANY

2409-15 Westmoreland Street • Philadelphia, Pa.

Manufacturers of Kitson Safety Devices (Lovekin Patents) for Domestic Water Heaters . . . Quality Brass Goods for Gas, Water and All Plumbing Uses

Belt Conveyors. "Belting Biographies," a 36-page booklet describing the company's complete line of transmission and conveyor belts, has been published by the Mechanical Goods Division, United States Rubber Co., 1790 Broadway, New York. It contains much technical information, including data on the selection of the proper belt, installation, speed of operation, pulley size, tension, carrying capacity, etc., as well as numerous types of transmission drives and conveyor layouts, together with suggestions for improving belting methods.

Receipting Machines. Bulletin of A. C. Gibson Co., 70 Oak St., Buffalo, describes their Band Dater receipting machine of interest to utility accounting and billing departments. Change of dates and names on die blocks are quickly and easily made.

Resistance Thermometer Bridge. Highly accurate measurements of temperatures from those in the neighborhood of absolute zero up to about 500 C are being made on the new Mueller resistance thermometer bridge. Measuring from 0 to 111.111 ohms in steps of 0.0001 ohm, it establishes a new level of accuracy for commercially available temperature measuring equipments in this range described in Catalog E-33C (1) sent on request by Leeds & Northrup Company, 4934 Stenton Avenue, Philadelphia, Pennsylvania.

Rare Gases. A four page folder entitled "Answers to Questions about the Rare Gases" is announced by the Air Reduction Sales Co., 60 East 42nd Street, New York, N. Y. It describes in an interesting manner the principles and history of gaseous tube lighting, has several charts dealing with the reduction of air, boiling points of liquid atmospheric gases, and colors obtainable through the use and proper relation of different gases, mercury and sign tubing.

The introduction of fluorescent tubing and its effect on the sign tube industry is covered in another part, together with information on each of the rare gases and mixtures thereof. Copy of the folder sent on request.

Valves. Nordstrom flexible coupling valves are illustrated and described with dimensional details and drawings in Bulletin V-129 issued by Merco Nordstrom Valve Co., 400 No. Lexington Ave., Pittsburgh. Now made with hub ends, connections can be made to steel or cast iron pipe by using any standard flexible coupling.

Gas Forge. Bulletin 352 of Hauck Mfg. Co., 124-10th St., Brooklyn, N. Y., shows among other items their "Handigas-forge" which burns any gaseous fuel using compressed air from 30 to 120 lbs. Forge measures 30x21x29 inches. Normal heating capacity 350 ¾x3" rivets per hour.

Catalogs

Face Shields. A bulletin covering a new line of face-shields used to protect workers from dust, sparks, heat, and glare, has been published by the Davis Emergency Equipment Company, 55 Van Dam Street, New York City.

Four different types of face shields are described ranging from a light weight, visorless shield to a shield with a fiber visor that protects the front part of the head from lacerations and bumps. All types are provided with replaceable transparent Plastacele windows which resist heat, acids, and caustics and are furnished in clear, green or amber colors.

Packers and Sand Pumps. A new 40-page illustrated catalog on Packers and Sand Pumps has just been published by Larkin & Co., of Butler, Pennsylvania. This new book contains valuable information and data on Packers and Sand Pumps as well as a great variety of kindred products manufactured and sold by this company. The

index is a special feature—it being arranged alphabetically with figure numbers so that at a glance important data and illustrations are available on the product desired.

Free copies may be obtained by writing directly to Larkin & Company, Butler, Pennsylvania.

Adding Machine. A light weight adding machine that adds and totals eight columns, subtracts, multiplies and measures but 8x14¾ inches is described in Remington Rand bulletin D85F. Copies available through any Remington Rand office.

Sales Manual. A manual for gas appliance salesmen entitled "More Income" giving in compact form much helpful data on range performance issued by Robertshaw Thermostat Co., Youngwood, Pa. Copies mailed gratis on application.

Heat Exchangers. Managers and engineers of plants in which process work involves heating or cooling of fluids will be interested in bulletin 1260 on heat transfer equipment, published by The Griscom-Russell Company. The bulletin illustrates and concisely lists the outstanding features of more than twenty designs of heat exchangers, heaters, coolers, condensers and evaporators, many of which have exclusive forms of heat transfer elements that permit recovery of waste heat or transfer of heat unobtainable in any other design. The bulletin also includes a convenient self-indexing reference table listing the most suitable types of heat exchangers for each special fluid and service. For copy address the Griscom-Russell Company, 285 Madison Avenue, New York City.

Metal Hose. Catalog 109 of Titeflex Metal Hose Co., Newark, N. J., describes the many uses of their product for conveying flammable liquids and gases including flexible connections for gas ranges, heaters, hot plates and irons.

"Rex-weld" and "Rex-tube" metal hose with details of applications including gas holder heating, lubrication systems, hot tar or asphalt handling and connections for gas burning furnaces are fully illustrated and described in catalog G 14 issued by Chicago Metal Hose Corp., Maywood, Ill.

Galvanized steel hose and couplings manufactured by Pennsylvania Flexible Metallic Tubing Co., of Philadelphia, under the trade name "Penflex" are covered in their bulletin 59 F. Copies sent on request.

Lathes. A new catalog giving description of the three models of workshop lathes has been published and is available to readers of this magazine by writing to the Technical Service Dept., South Bend Lathe Works, South Bend, Indiana.

Recording Instruments. For recording on one chart, pressure, volume, temperature and time, in measurement of gas, the Foxboro P.V.T.T. recorder or metergraph is described in detail in Bulletin 757 of the Foxboro Company, Foxboro, Mass.

Spark Ranges. A new folder issued by Hammer-Bray Co. Ltd. of Oakland, Calif., describes and illustrates the exclusive features of this CP Range which includes their patented built-in gas circulating heater to bring comfortable warmth to the kitchen during the chilly hours of morning and evening. Two bungalow types are also shown.

Protective Coatings. Metal coatings for Gas Holders, Stacks, Scrubbers, Condensers and other gas plant equipment are described in Quigley Triple-A bulletin C-284. Copies available through Quigley Company, 56 West 45th St., New York.

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(Continued from page 31)

Court in the case of Pacific Gas & Electric Co. v. Commission of California et al., 20 F. Supp. 507, it is interesting to observe that the amortization for pipe repair expense of $324,815 was disallowed as an expense, but allowed as a recognition of depreciation to be included in the depreciation annuity. The item of $657,815 for cut over expense was disallowed excepting as reflected in going concern value. The allowance for general and administrative expense, fire and casualty insurance, injuries and damages at $702,000, less $51,137.66 for fire insurance, or an aggregate of $650,862.44 was the amount found by the commission; and it was approved by the court subject to minor corrections.

When it is considered that the higher courts generally hold that gas corporations are entitled to a return of at least 6% on the investment, very frequently relatively small differences between the final judgment of the court and the contentions of the gas corporation's officials, as to net revenue, expenses and investment, is sufficient to result in a gas rate state law or city ordinance being invalid.

In the above mentioned case of Pacific Gas & Electric Co. the higher court held the fair value of the gas company's property to be $90,507,359 and that this investment netted a satisfactory return of 6.625%. It is interesting to observe that this court modified the holding of the Public Service Commission as in the table page 31.

Appliance Sales Soar

May Business Tops All Records

Soaring high above the previous all-time record, Brooklyn Union Gas Company appliance sales, at the end of the first five months of this year, stood at the unprecedented total of $1,511,991.88.

The five-month figure was more than $250,000 above the previous high mark, established in the first five months of 1937. It was $345,498.24, or 30 per cent, above the total for the same period last year.

Never before in the 91 years that gas has been available to the residents of Brooklyn have gas appliances been in so great a demand.

During May, sales zoomed even more spectacularly than they had done during the immediately preceding months. The May sales totaled $569,033.18, a figure which not only topped the previous May record—it was the highest total for *any* month in the company's long history.

As compared with the previous May record—established in 1937—last month's sales showed a gain of $236,096.40, or 71%.

As compared with the best previous month—September, 1937—last month's sales were higher by $66,219.35, or 13%.

Each of the past four months has witnessed a gain over the corresponding month last year.

During the week ended June 16, 891 appliances were sold. This is a gain of 25% over the corresponding week of last year.

Retail, wholesale and total sales were greater for the week than for the corresponding period of 1938. There were 532 units sold at retail. This is a gain of 35% over the corresponding week of last year. Wholesale sales registered a gain of 13% over last year.

Refrigerators showed the greatest gain. The 557 Servel units sold represents an increase of 54% over the corresponding week of last year. The gains recorded practically every week in refrigerator sales indicate that 1939 will be the banner year for refrigeration.

Coutant with Controlled Steam Generators Inc.

Controlled Steam Generators, Inc., announces the appointment of J. G. Coutant as Vice President in charge of engineering work in connection with the design and construction of Steam Generators with Controlled-Pressure Circulation and Metallic Heat Recuperators with Controlled-Pressure Circulation. Included are projects for reconditioning existing boiler plants with multiple furnace construction for the purpose of increasing the steam output without an increase in plant investment.

An important work will be the reconditioning of mill and industrial furnaces with light-weight refractories and Metallic Heat Recuperators, which make not only large savings in fuel consumption, but a corresponding economy in labor, plant overhead expense, and capital investment.

Obituary

J. G. O'KEEFFE

James G. O'Keeffe, general superintendent of manufacture, Gas Department, Public Service Corporation of New Jersey, died suddenly June 9, at the Stamford Hospital, Stamford, Conn.

Mr. O'Keeffe started with the company as a cadet engineer in the Front Street Gas Works in 1907, after being graduated from Stevens Institute of Technology. In 1909 he was transferred to the Gas Distribution Department and later became superintendent, Market Street Gas Works. He was made engineer of construction in 1925 and general superintendent of gas manufacture in 1926.

He was a member of the American Gas Association, New Jersey Gas Association, Society of Gas Lighting and the New Jersey Society of Professional Engineers.

JOHN WEEDON

John Weedon, who was for years advertising manager of the Peoples Gas Light & Coke Co., Chicago, Ill., until he retired in 1933, died June 5th at his home in Wilmette, Ill., at the age of 70. Mr. Weedon, born in England, came to Chicago in 1899, and had been with the gas company since then.

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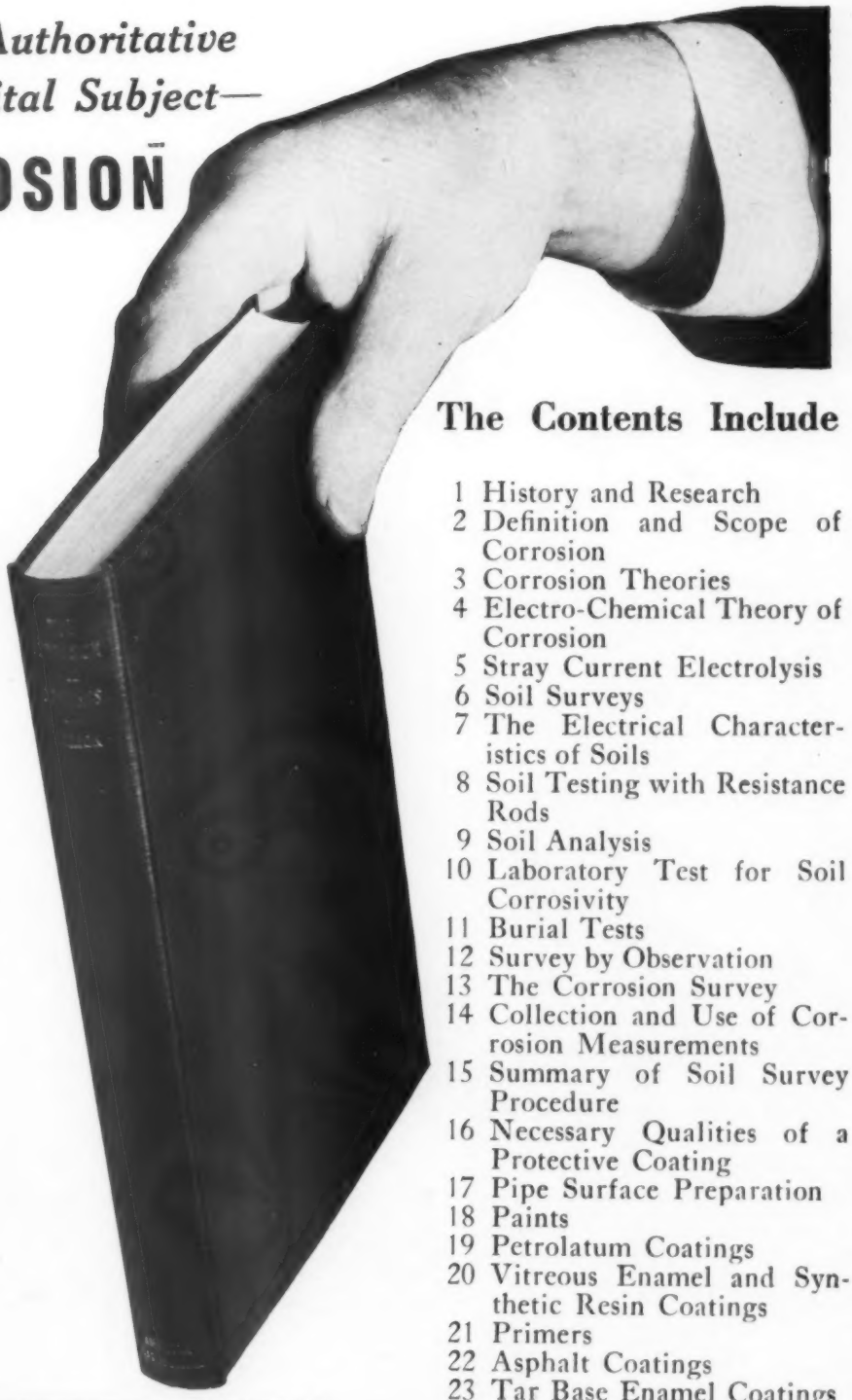

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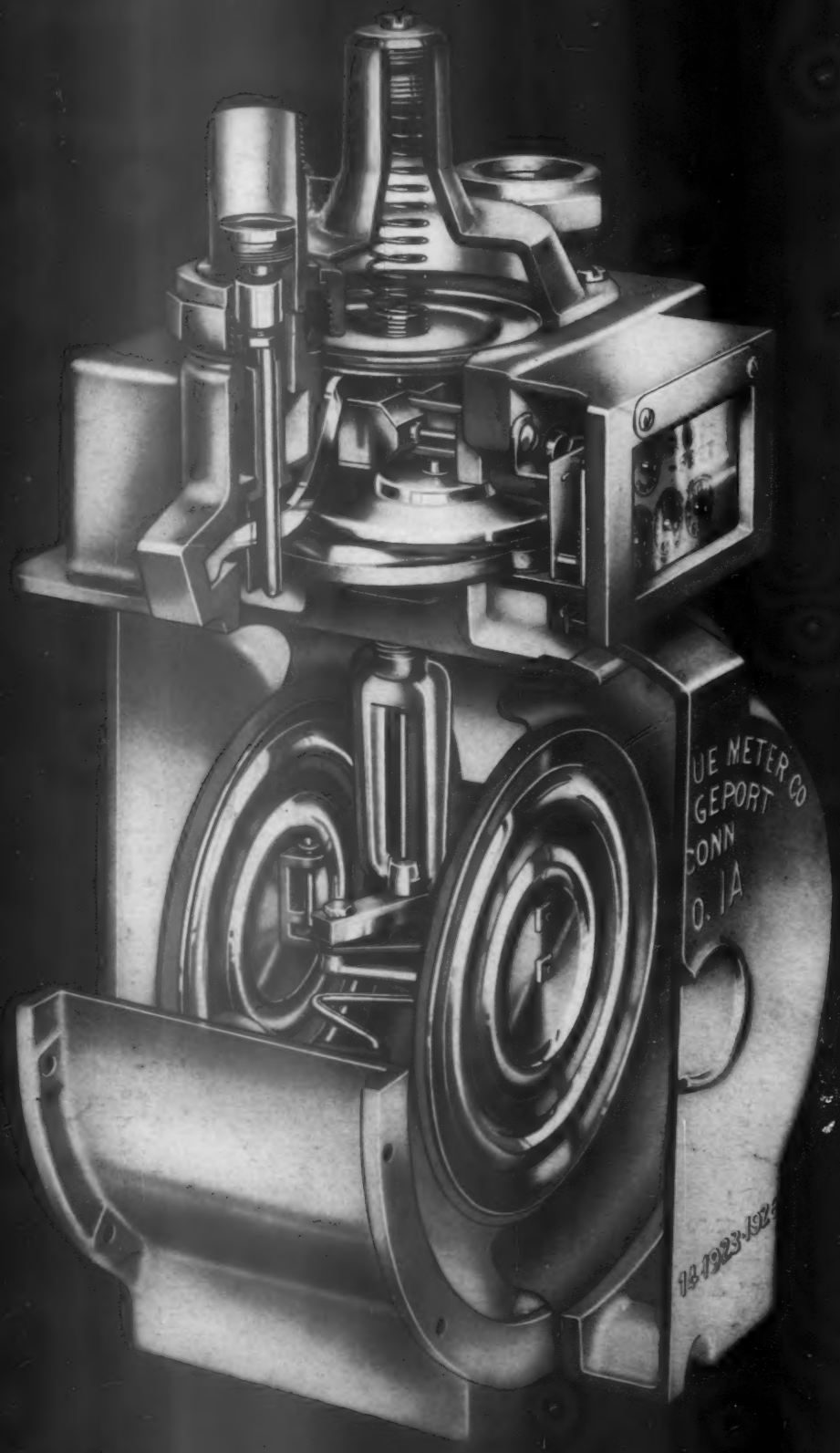

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